55-1520-238-23-7

TM 55-1520-238-23-7

DESCRIPTION AND OPERATION -
FLIGHT CONTROLS

MAINTENANCE -
CONTROL SURFACES

MAINTENANCE -
MECHANICAL FLIGHT CONTROLS

MAINTENANCE -
ELECTRICAL FLIGHT CONTROLS

MAINTENANCE -
DIRECTIONAL CONTROLS

MAINTENANCE -
RIGGING FLIGHT CONTROLS

TECHNICAL MANUAL

AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL

FOR

ARMY
AH-64A HELICOPTER

CHAPTER 11
FLIGHT CONTROLS

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This manual together with TM 55-1520-238-23-1, 7 June 1988, TM 55-1520-238-23-2, 7 June 1988, TM 55-1520-238-23-3, 7 June 1988, TM 55-1520-238-23-4, 7 June 1988, TM 55-1520-238-23-5, 7 June 1988, TM 55-1520-238-23-6, 7 June 1988, TM 55-1520-238-23-8, 7 June 1988, TM 55-1520-238-23-9, 7 June 1988, TM 55-1520-238-23-10, 7 June 1988, supersedes TM 55-1520-238-23-1, 4 March 1985, TM 55-1520-238-23-2, 4 March 1985, TM 55-1520-238-23-3, 4 March 1985, TM 55-1520-238-23-4, 4 March 1985, TM 55-1520-238-23-5, 4 March 1985, TM 55-1520-238-23-6, 4 March 1985, TM 55-1520-238-23-7, 4 March 1985, TM 55-1520-238-23-8, 4 March 1985.

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7 JUNE 1988

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CHAPTER 11

FLIGHT CONTROL SYSTEM

CHAPTER OVERVIEW

This chapter contains description and operation information and maintenance instructions for the flight control system.

Flight control system troubleshooting information is in TM 55-1520-238-T.

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Section I. FLIGHT CONTROL SYSTEM

DESCRIPTION AND OPERATION

11-1-1. FLIGHT CONTROLS DESCRIPTION AND OPERATION 11-1-1

A. The flight controls are in the crew station. (See the next page.)

B. Flight control inputs control the helicopter on the ground and in flight.

C. Both pilot and copilot gunner (CPG) have flight controls.

D. Control of the helicopter requires three major control systems. They are:

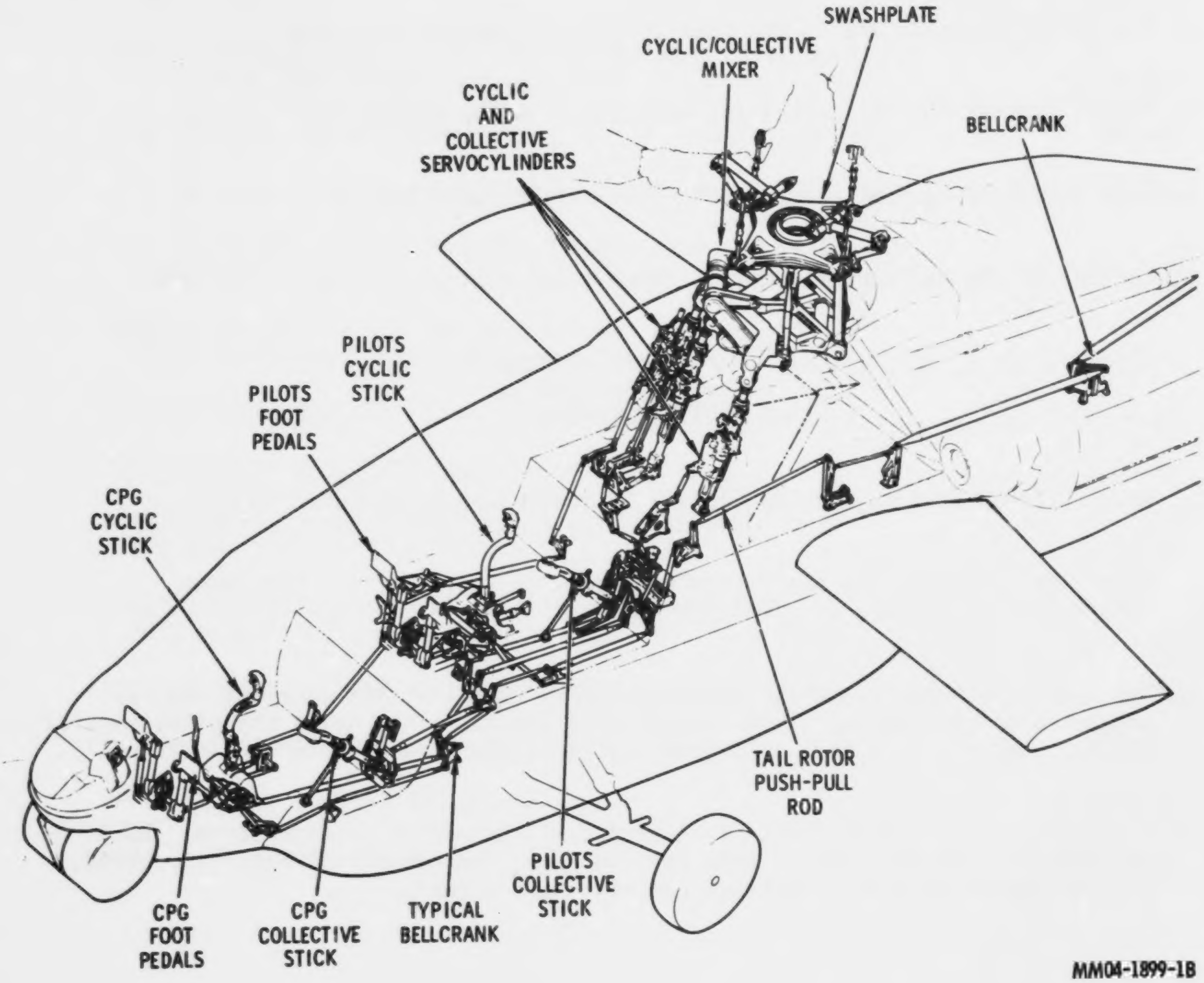
Directional Controls
Collective Controls
Cyclic Controls

E. An additional system, the stabilator, is controlled by computer inputs.

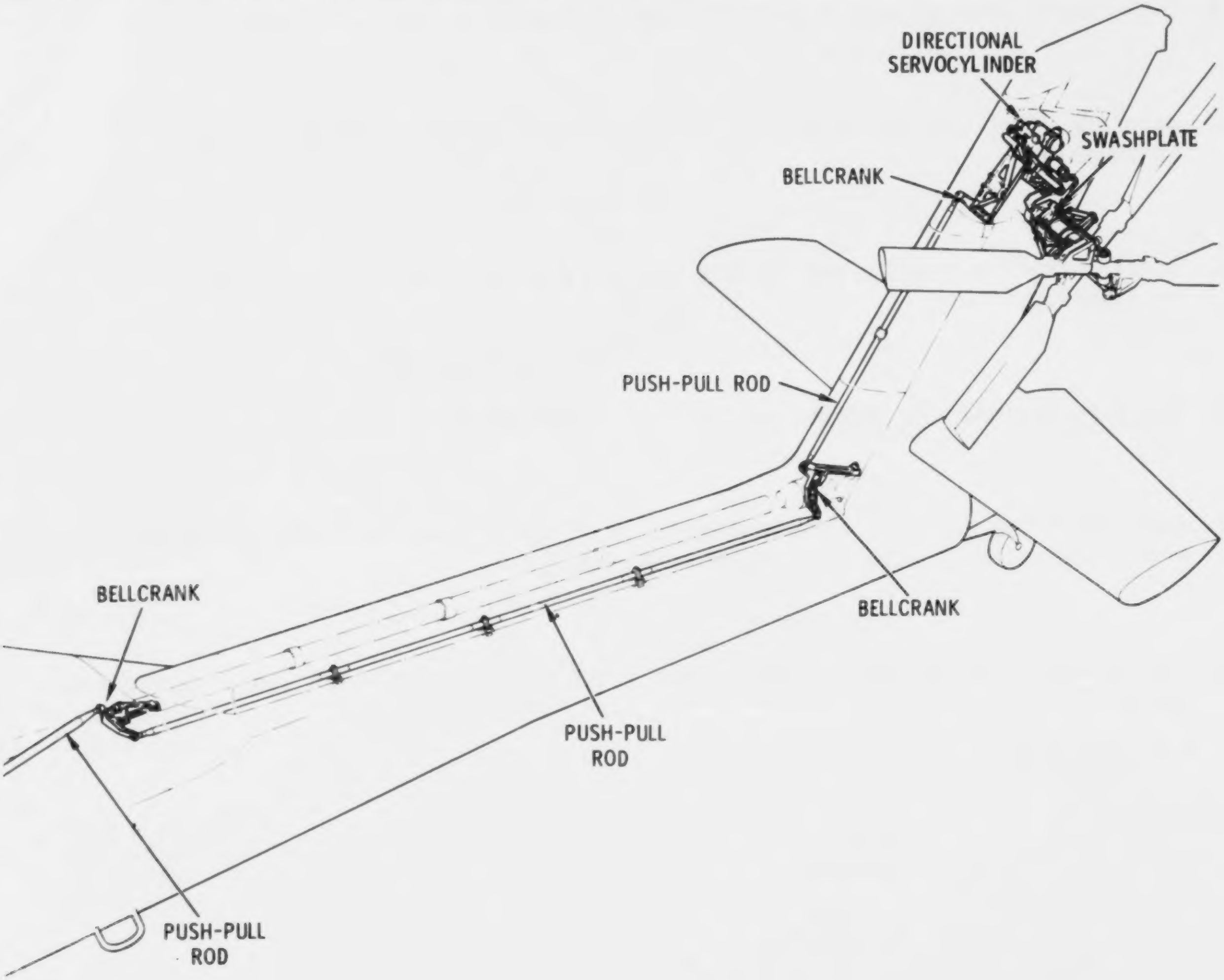
F. All flight controls are boosted by hydraulic servocylinders. (For more information on servos, go to chapter 7.)

G. The digital automatic stabilization equipment (DASE) system is electrically-connected to each servo. This system has a computer that helps the pilot control the helicopter. It senses helicopter attitude and moves the servo electrically.

H. A backup control system (BUCS) is electrically-connected to each servo. BUCS operates if a control jams. When this happens, the control linkage is severed, and the servos receive electrical/control input signals.


SWASHPLATE
CYCLIC/COLLECTIVE MIXER
CYCLIC AND COLLECTIVE SERVOCYLINDERS
BELLCRANK
PILOTS CYCLIC STICK
PILOTS FOOT PEDALS
CPG CYCLIC STICK
TAIL ROTOR PUSH-PULL ROD
PILOTS COLLECTIVE STICK
CPG FOOT PEDALS
CPG COLLECTIVE STICK
TYPICAL BELLCRANK

MM04-1899-1B


DIRECTIONAL SERVOCYLINDER
SWASHPLATE
BELLCRANK
PUSH-PULL ROD
BELLCRANK
BELLCRANK
PUSH-PULL ROD
PUSH-PULL ROD

MM04-1899-2A

11-1-2. DIRECTIONAL FLIGHT CONTROLS DESCRIPTION AND OPERATION (cont) 11-1-2

A. Directional control pedals provide control inputs to the tail rotor.

B. Both the pilot and CPG have left and right foot pedals. The pedals are adjustable.

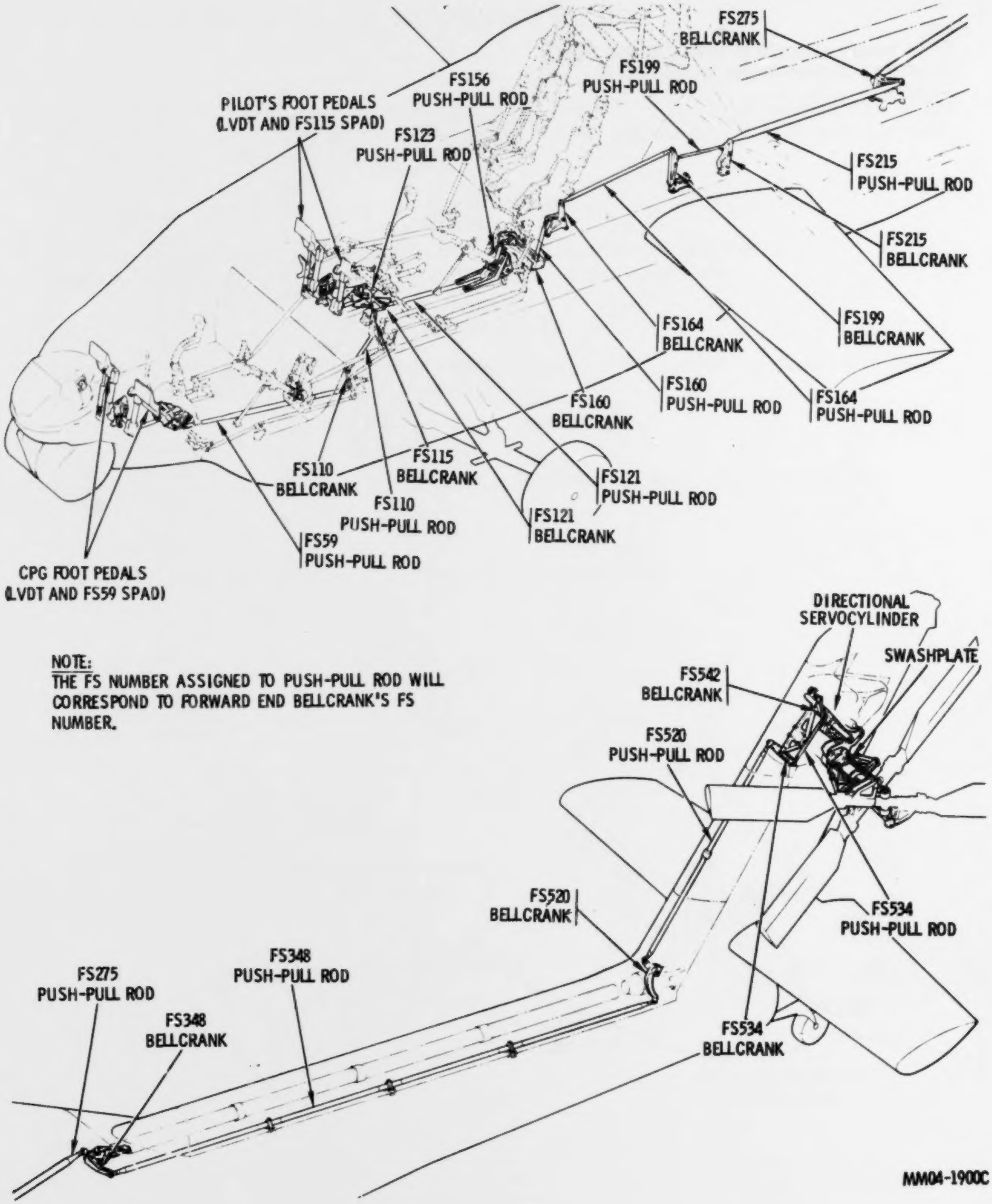
C. Pedal motion is transferred through a system of push-pull rods and bellcranks to a servocylinder.

D. The servocylinder is located at the tail rotor gearbox.

E. One end of the servo is attached to the tail rotor gearbox. The hydraulic boost end is connected to the tail rotor swashplate.

F. Swashplate in-or-out motion moves four pitch links. The pitch links change the angle of four tail rotor blades at the same time.

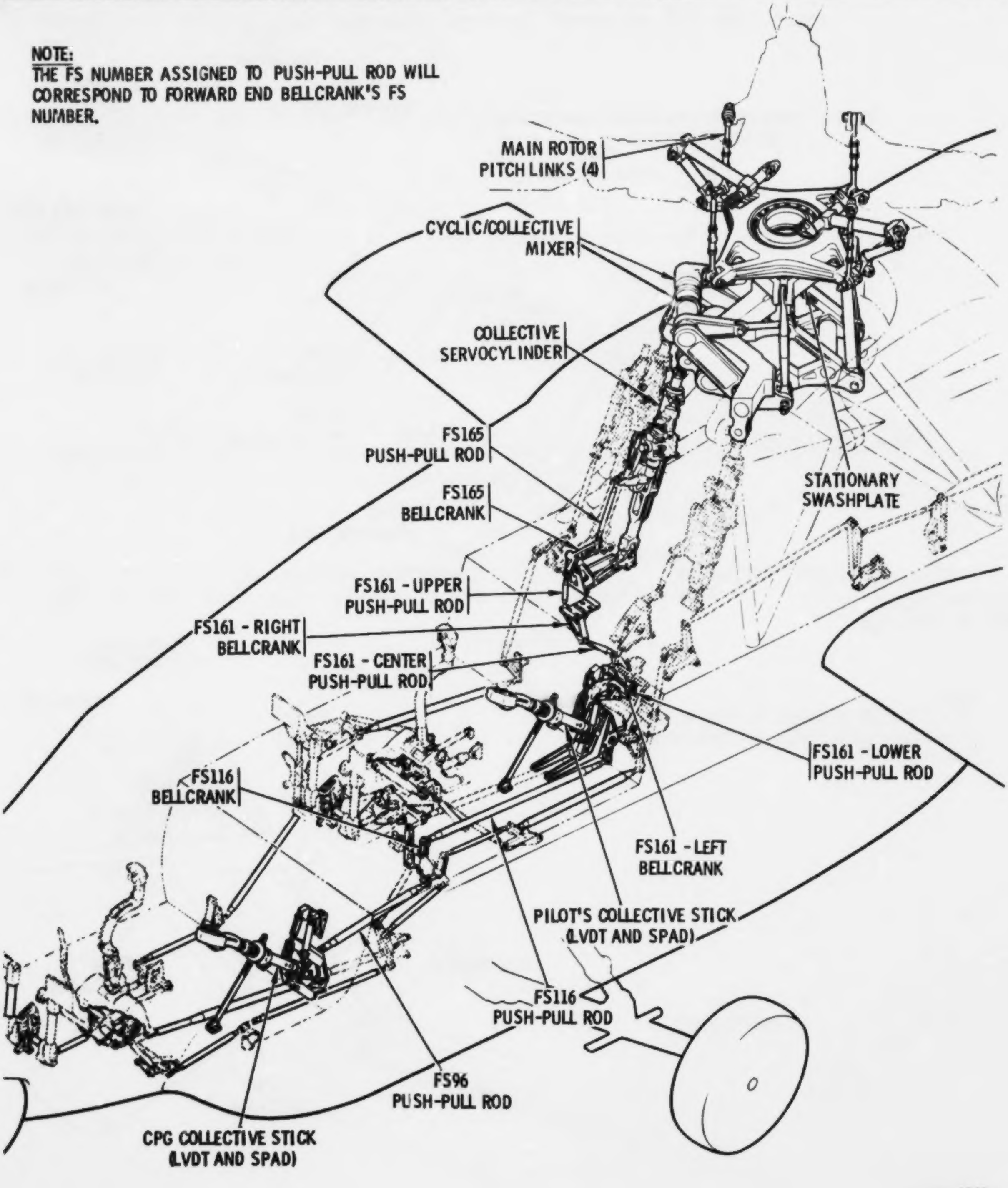
11-1-2. DIRECTIONAL FLIGHT CONTROLS DESCRIPTION AND OPERATION 11-1-2


FS275 BELLCRANK
FS199 PUSH-PULL ROD
FS156 PUSH-PULL ROD
PILOT'S FOOT PEDALS (LVDT AND FS115 SPAD)
FS123 PUSH-PULL ROD
FS215 PUSH-PULL ROD
FS215 BELLCRANK
FS199 BELLCRANK
FS164 BELLCRANK
FS160 PUSH-PULL ROD
FS164 PUSH-PULL ROD
FS160 BELLCRANK
FS110 BELLCRANK
FS115 BELLCRANK
FS110 PUSH-PULL ROD
FS121 PUSH-PULL ROD
FS121 BELLCRANK
FS59 PUSH-PULL ROD
CPG FOOT PEDALS (LVDT AND FS59 SPAD)
DIRECTIONAL SERVOCYLINDER
SWASHPLATE
FS542 BELLCRANK
FS520 PUSH-PULL ROD
FS520 BELLCRANK
FS534 PUSH-PULL ROD
FS348 PUSH-PULL ROD
FS275 PUSH-PULL ROD
FS348 BELLCRANK
FS534 BELLCRANK
MM04-1900C

NOTE:
THE FS NUMBER ASSIGNED TO PUSH-PULL ROD WILL CORRESPOND TO FORWARD END BELLCRANK'S FS NUMBER.

11-1-3. CYCLIC FLIGHT CONTROLS DESCRIPTION AND OPERATION 11-1-3

NOTE:
THE FS NUMBER ASSIGNED TO PUSH-PULL ROD WILL CORRESPOND TO FORWARD END BELLCRANK'S FS NUMBER.


MAIN ROTOR PITCH LINKS (4)
CYCLIC/COLLECTIVE MIXER
COLLECTIVE SERVOCYLINDER
FS165 PUSH-PULL ROD
FS165 BELLCRANK
STATIONARY SWASHPLATE
FS161 - UPPER PUSH-PULL ROD
FS161 - RIGHT BELLCRANK
FS161 - CENTER PUSH-PULL ROD
FS161 - LOWER PUSH-PULL ROD
FS116 BELLCRANK
FS161 - LEFT BELLCRANK
PILOT'S COLLECTIVE STICK (LVDT AND SPAD)
FS116 PUSH-PULL ROD
FS96 PUSH-PULL ROD
CPG COLLECTIVE STICK (LVDT AND SPAD)

MM04-1901C

11-1-3. CYCLIC FLIGHT CONTROLS DESCRIPTION AND OPERATION (cont) 11-1-3

A. Cyclic sticks are in front of the pilot and the CPG.

B. The cyclic stick provides input to the main rotor. This input varies the pitch on the main rotor blades. Stick movement causes the rotor to tilt and fly the helicopter in the direction selected.

C. Lateral and longitudinal control motion is transferred through a series of push-pull rods and bellcranks. Each goes to a servocylinder.

D. Each servocylinder is attached to the airframe. The hydraulic boost end is connected to the cyclic/collective mixer.

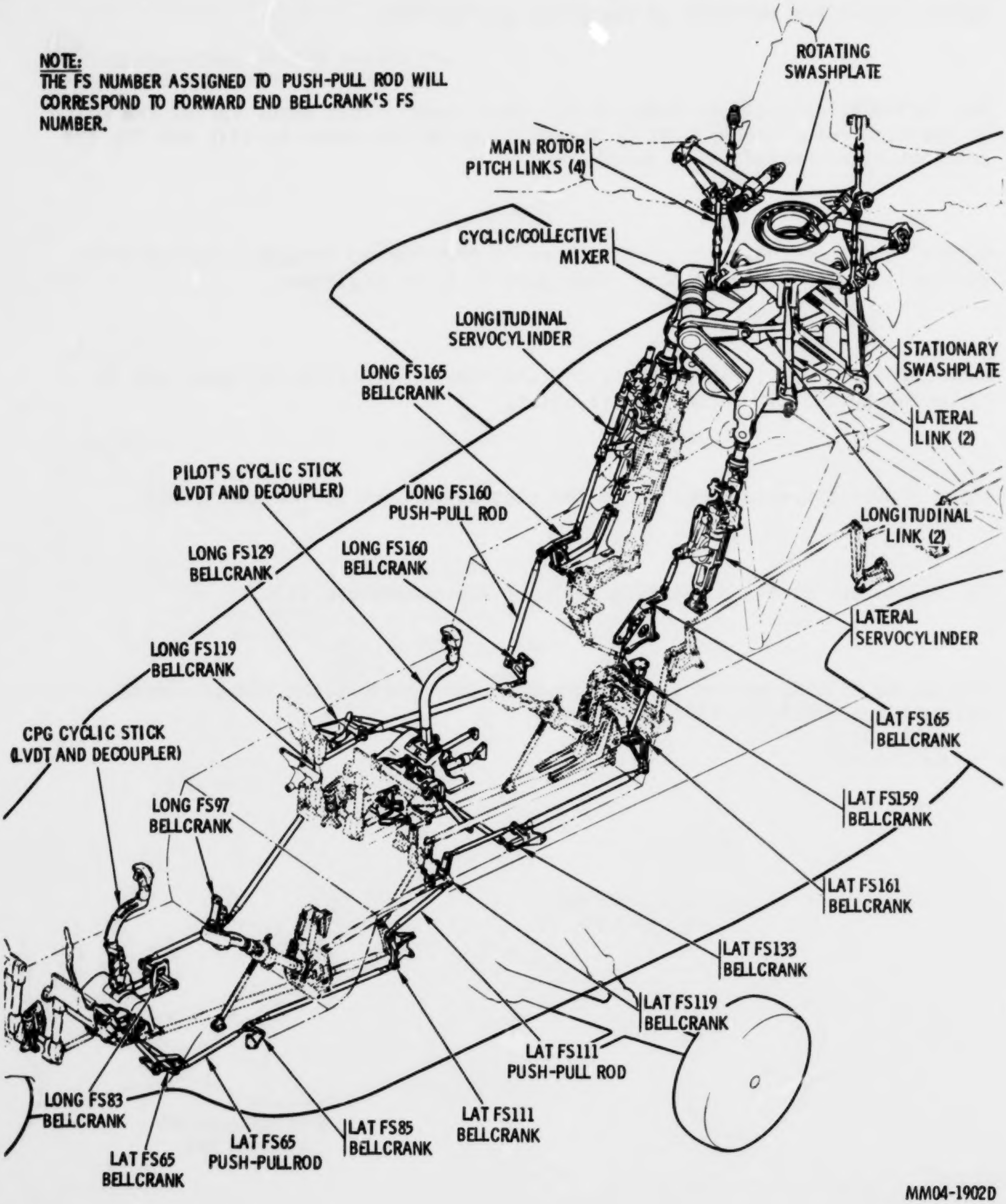
E. Mixer controls transmit motion to the stationary part of the swashplate.

F. The stationary part and rotating parts of the swashplate tilt.

G. Swashplate tilting motion moves four main rotor blade pitch links. These change blade pitch and tilt the rotor.

11-1-4. COLLECTIVE FLIGHT CONTROLS DESCRIPTION AND OPERATION 11-1-4

NOTE:
THE FS NUMBER ASSIGNED TO PUSH-PULL ROD WILL CORRESPOND TO FORWARD END BELLCRANK'S FS NUMBER.


ROTATING SWASHPLATE
MAIN ROTOR PITCH LINKS (4)
CYCLIC/COLLECTIVE MIXER
LONGITUDINAL SERVOCYLINDER
STATIONARY SWASHPLATE
LONG FS165 BELLCRANK
LATERAL LINK (2)
PILOT'S CYCLIC STICK (LVDT AND DECOUPLER)
LONG FS160 PUSH-PULL ROD
LONGITUDINAL LINK (2)
LONG FS129 BELLCRANK
LONG FS160 BELLCRANK
LATERAL SERVOCYLINDER
LONG FS119 BELLCRANK
LAT FS165 BELLCRANK
CPG CYCLIC STICK (LVDT AND DECOUPLER)
LAT FS159 BELLCRANK
LONG FS97 BELLCRANK
LAT FS161 BELLCRANK
LAT FS133 BELLCRANK
LAT FS119 BELLCRANK
LAT FS111 PUSH-PULL ROD
LONG FS83 BELLCRANK
LAT FS111 BELLCRANK
LAT FS85 BELLCRANK
LAT FS65 PUSH-PULLROD
LAT FS65 BELLCRANK

MM04-1902D

11-1-4. COLLECTIVE FLIGHT CONTROLS DESCRIPTION AND OPERATION 11-1-4

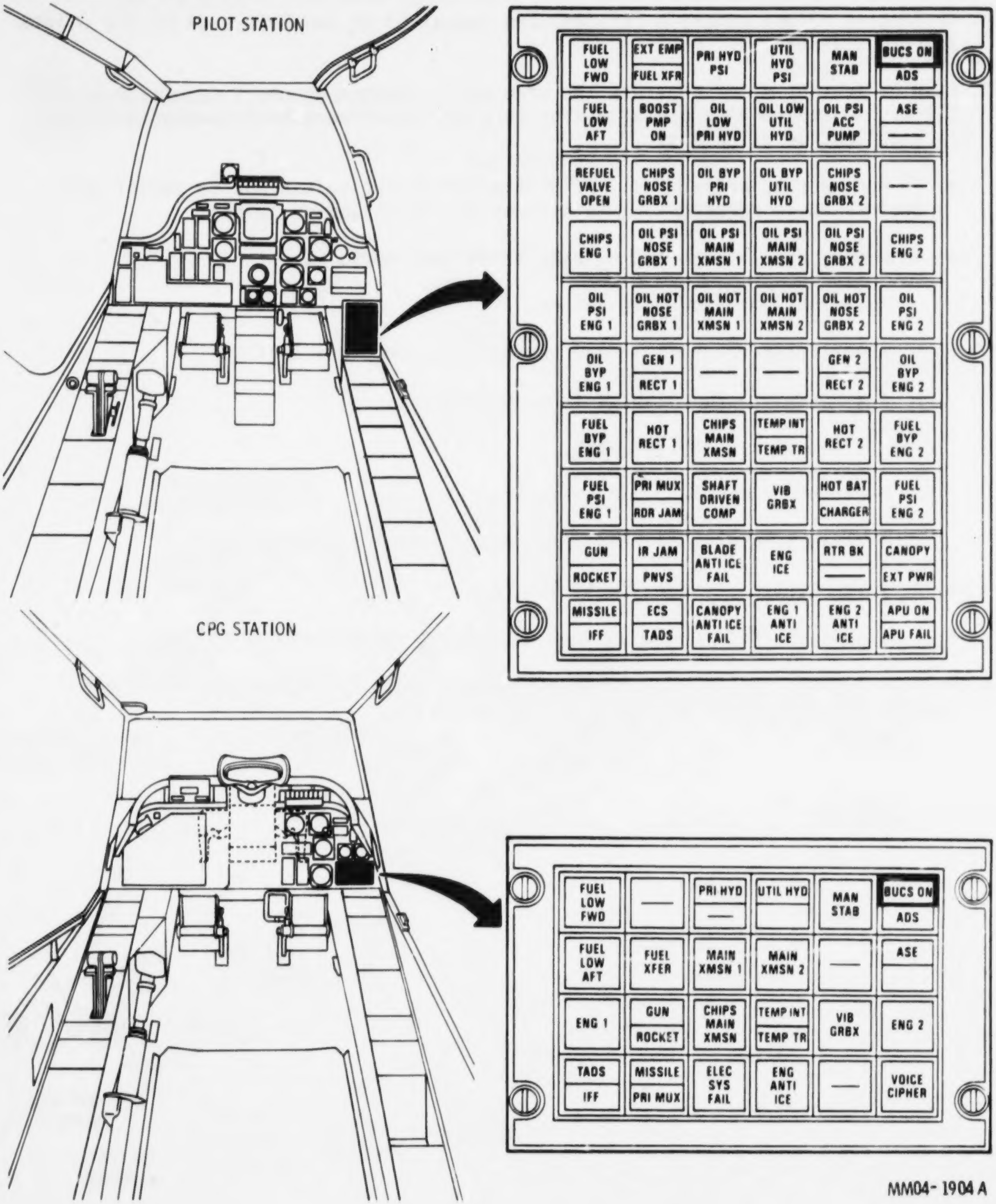
A. Collective flight controls (sticks) are installed on the left side of the pilots and CPG stations.

B. Each collective stick provides the crew member with a means of adjusting blade pitch, and controlling gas generator turbine fuel-flow metering requirements. Each collective stick has:

- An engine chop collar just aft of the collective switch box to permit both engines to be reduced to idle without moving the power levers.
- A switch panel at the end of each stick that contains:
    - A searchlight (SRCH LT) switch,
    - An extend-retract (EXT-RET) searchlight momentary switch,
    - A wing-stores (ST-JTSN) guarded switch,
    - A night-vision (NVS) switch,
    - A boresight (BRST) polarity switch,
    - A radio-frequency override (RF-OVRRD) switch [nonfunctional].
- A backup control system (BUCS) switch.
- A twist-type friction adjustment to prevent stick creep in flight.

C. Push-pull rods, bellcranks, a servocylinder, and a cyclic/collective mixer connect the collective sticks to the main rotor.

11-1-5. FLIGHT CONTROL-CAUTION/WARNING PANEL INDICATORS DESCRIPTION AND OPERATION 11-1-5


PILOT STATION
FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
CPG STATION
FUEL LOW FWD
PRI HYD
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER

MM04-1904 A

11-1-5. FLIGHT CONTROL CAUTION/WARNING PANEL INDICATORS DESCRIPTION AND OPERATION (cont) 11-1-5

A. Indicator lights are provided on the pilot and CPG caution and advisory panels.

B. The lights monitor the electrical backup control system (BUCS):

BUCS ON is an amber light. It indicates that the BUC system is operating. This indicates control linkage damage.

BUCS FAIL is a red light. It indicates an electrical failure (BUCS).

Section II. FLIGHT CONTROLS MAINTENANCE - GENERAL

11-2-1. SELF-RETAINING BOLT FIT CHECK 11-2-1

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

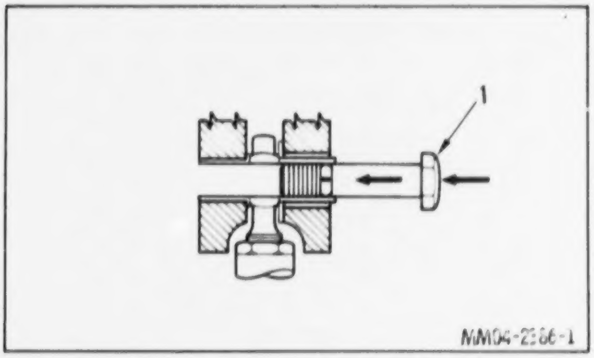
NOTE

The fastener and attaching surfaces shall be clean and dry. No lubrication shall be used for installation.

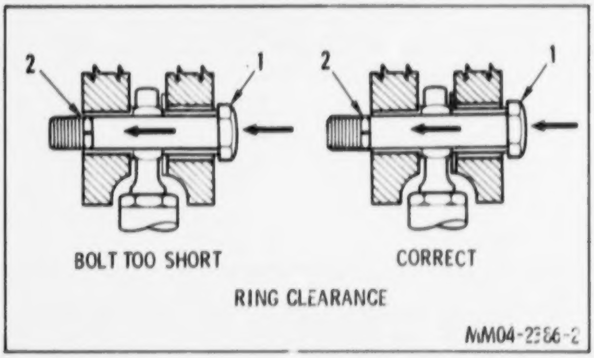
1. **Install the self-retaining bolt (1) into the item to be assembled.**

   a. Aline bores of items to be assembled.

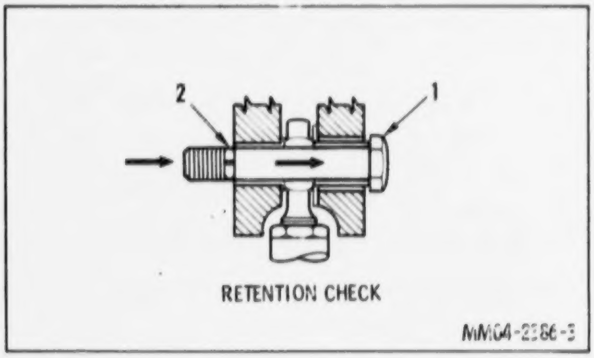
   b. Push bolt (1) through assembly until it is fully seated.


1
MM04-2386-1

2. **Check for retaining ring (2) clearance.** If retaining ring (2) does not completely emerge through other side of assembly, bolt (1) is too short and must be replaced.

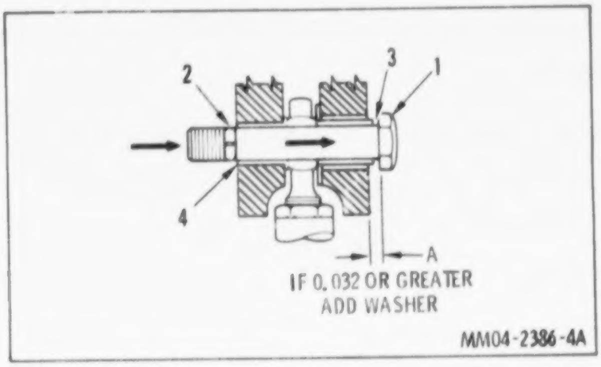

2
1
2
1
BOLT TOO SHORT
CORRECT
RING CLEARANCE
MM04-2386-2

3. **Check for proper retention.** If bolt (1) can be pulled out of the assembly without any restraining force, the bolt (1) and assembly should be checked for proper size.


2
1
RETENTION CHECK
MM04-2386-3

GO TO NEXT PAGE

11-2-1. SELF-RETAINING BOLT FIT CHECK (cont) 11-2-1



4. **Check gap under bolt head (1).**

   a. Pull on bolt (3) until retaining ring (2) inside edge is flush with surface (4).

   b. Measure gap between bolt head (1) and surface (4).

   c. If gap A is **0.032 inch** or greater, add AN960C washer under head of bolt (1). Maximum thickness of washer stackup: **0.063 inch.**

5. **Check that retaining ring (2) clears surface (4) completely.** Remove one washer and replace with thinner washer if retaining ring (2) does not clear surface (4).

END OF TASK

11-2-2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD, ADJUSTABLE ROD END REPLACEMENT/ADJUSTMENT 11-2-2

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION E. ADJUSTMENT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

(E29)	Lockwire

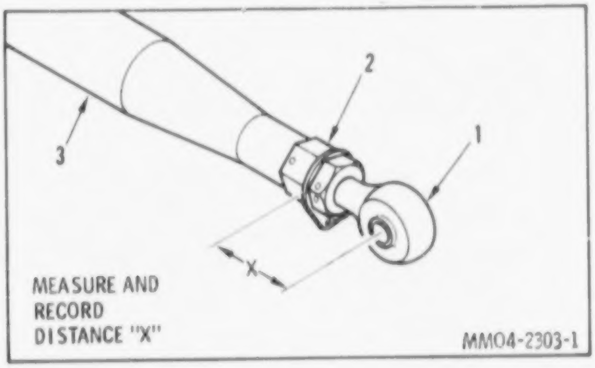
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

A. REMOVAL

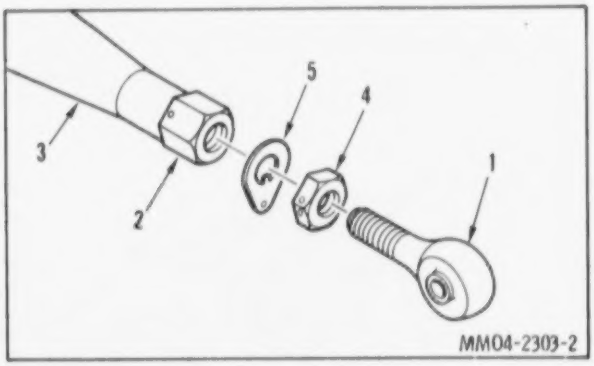
1. **Measure and record distance from center of bolt hole in rod end (1) to top of fixed nut (2).**

2. **Remove rod end (1) from push-pull rod (3).**
   - a. Remove lockwire.
   - b. Hold fixed nut (2). Loosen nut (4).
   - c. Lift key washer (5) clear of slot in rod (3). Remove rod end (1) from rod (3).
   - d. Remove key washer (5) and nut (4) from rod end (1).



MEASURE AND RECORD DISTANCE "X"

MM04-2303-1



MM04-2303-2

B. CLEANING

Wipe rod, nut, and key washer with a clean rag.

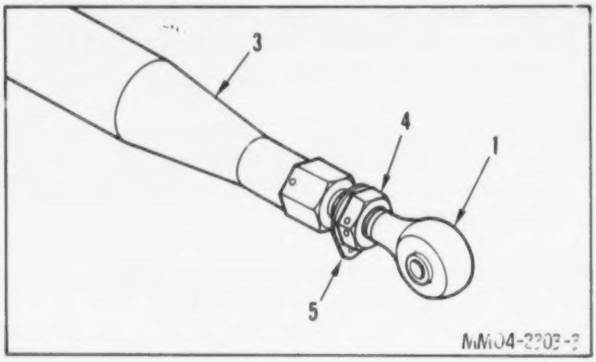
GO TO NEXT PAGE

11-2-2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD, ADJUSTABLE ROD END REPLACEMENT/ADJUSTMENT (cont) 11-2-2

C. INSPECTION

1. **Check nut and key washer for damage and wear.** None allowed.

2. **Check nut and key washer for** corrosion (para 1-5-38).



D. INSTALLATION

1. **Install new rod end (1) on push-pull rod (3).**

   a. Engage threads of rod end (1) with nut (4). Install nut (4) on rod end (1) as far as it will go.

   b. Install key washer (5) on rod end (1) as far as it will go.

   c. Engage threads of rod end (1) with threads of rod (3). Install rod end (1) on rod (3).

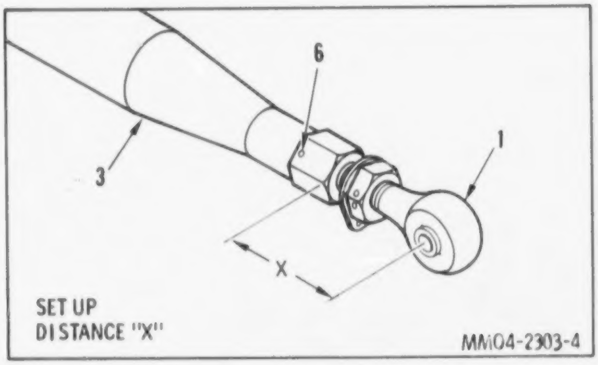
E. ADJUSTMENT

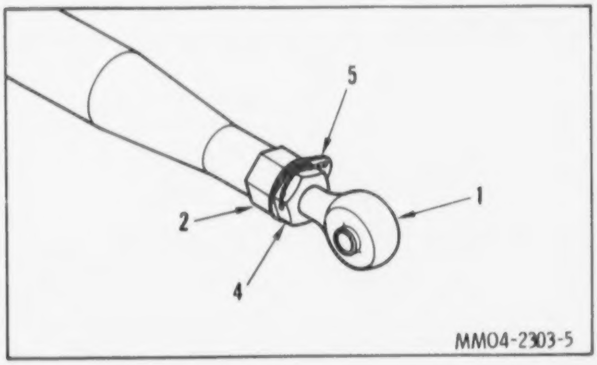
1. **Install rod end (1) on push-pull rod (3) to obtain distance recorded in step A.1.**

2. **Check for proper thread engagement by attempting to insert lockwire (E29) into witness hole (6).**

   a. If lockwire can be inserted in witness hole (6), thread engagement is not correct. Check for correct parts, and adjust push-pull rod during rigging procedure.

   b. If lockwire cannot be inserted in witness hole (6), thread engagement is correct. Go to step E.3.





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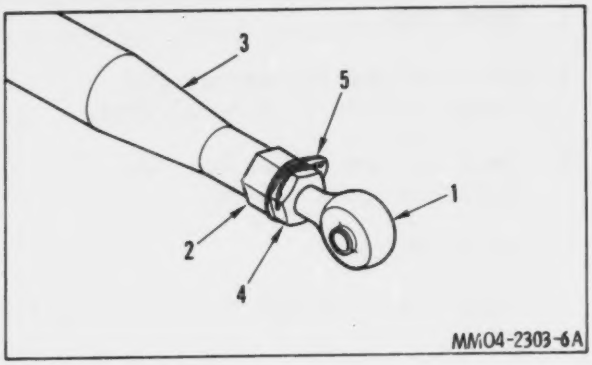
11-2-2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD, ADJUSTABLE ROD END REPLACEMENT/ADJUSTMENT (cont) 11-2-2



3. Hold rod end (1) in position and slide key washer (5) down to engage key in slot in rod (3).

4. Hold fixed nut (2). Tighten nut (4) against key washer (5). Ensure that rod end position has not been disturbed.

5. Install lockwire (E29) through nut (4) and key washer (5).

6. Inspect (TI).

END OF TASK

11-2-3. NONADJUSTABLE PUSH-PULL ROD REPLACEMENT 11-2-3

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

NOTE

This task is typical for all directional, collective, lateral, and longitudinal nonadjustable push-pull rod assemblies.

A. **REMOVAL**

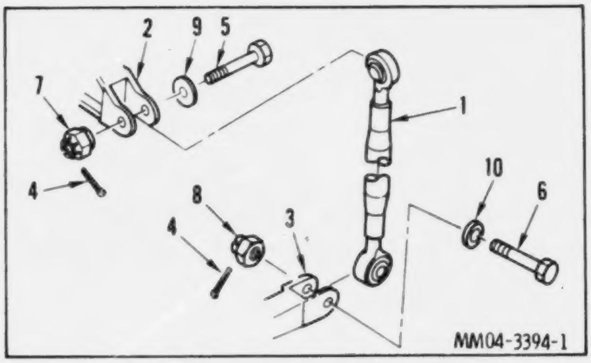
1. **Remove nonadjustable push-pull rod (1) from bellcranks (2) and (3).**

   a. Remove and discard two cotter pins (4).

   b. Hold bolts (5) and (6). Remove two nuts (7) and (8).

   c. Remove bolt (5), washer (9), bolt (6), and washer (10) from bellcranks (2) and (3) and rod (1).

   d. Remove rod (1) from bellcranks (2) and (3).



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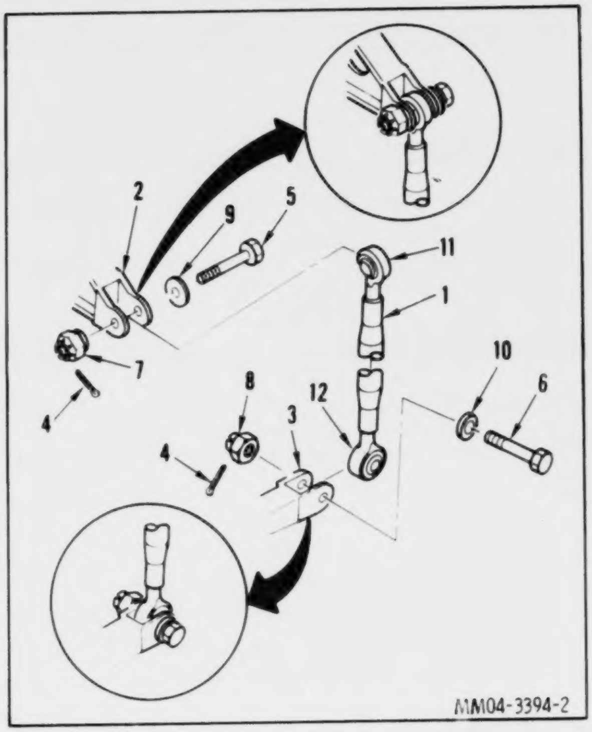
11-2-3. NONADJUSTABLE PUSH-PULL ROD REPLACEMENT (cont) 11-2-3



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bolt and washer for damage and wear.** None allowed.
2. **Check bolt and washer for corrosion** (para 1-5-38).

D. INSTALLATION

1. **Install new rod assembly (1) in bellcranks (2) and (3).** Torque nuts (7) and (8) **30 to 40-INCH-POUNDS.**
    - a. Aline rod end (11) with bellcrank (2).
    - b. Install bolt (5) through washer (9), bellcrank (2) and rod end (11).
    - c. Aline rod end (12) with bellcrank (3).
    - d. Install bolt (6) through washer (10), bellcrank (3) and rod end (12).
    - e. Install nuts (7) and (8) on bolts (5) and (6).
    - f. Hold bolts (5) and (6).
    - g. Torque nuts (7) and (8) to **30 INCH-POUNDS.**
    - h. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
    - i. Install two new cotter pins (4) in nuts (7) and (8).
2. **Inspect (TI).**

END OF TASK

Section III. FLIGHT CONTROLS MAINTENANCE - MECHANICAL

11-3-1. FLIGHT CONTROLS - INSPECTION 11-3-1

1. **General.** Check pilot and CPG cyclic and collective sticks, control rods, bellcranks, brackets, supports, idlers, and other components for dents, gouges, scratches, corrosion, loose mounting, and other damage.

2. **Control rods.**

   a. Straightness must be within **0.030-inch.**

   b. Any damage is not to exceed **0.010-inch** or 10% of wall thickness, whichever is less deep and **1-inch** long.

   c. Scratches and gouges not to exceed 1/3 circumference of rod after repair.

   d. For additional limits refer to TM 55-1500-204-25/1.

3. **Scissors.** Maximum allowable spherical bearing radial play - **0.010-inch.**

4. **Bushings and bearings.** Maximum allowable wear limits:

   a. Radial play with bolt in bushing or bearing inside diameter - **0.004-inch.**

   b. Radial play with sliding bushing in flanged inside diameter - **0.004-inch.**

   c. Radial play in ball bearing - **0.002-inch.**

   d. Radial play of Teflon bearing - **0.006-inch.**

   e. Radial play in control rod end bearing - **0.002-inch.**

   f. Axial play in Teflon bearing - **0.016-inch.**

   g. Axial play in control rod end bearing - **0.009-inch.**

5. **Pitch link.**

   a. Gouges and scratches not to exceed **0.003-inch** deep and **0.025-inch** long.

   b. Rod end threads should be snug but free to turn in barrel.

   c. Maximum allowable radial play - **0.017-inch.**

   d. Maximum allowable axial play - **0.030-inch.**

   e. Wear and chafing (metal-to-metal) with swashplate clevis, maximum allowable rod damage depth - **0.010-inch.**

GO TO NEXT PAGE

6. **Swashplate - Spherical Bearing Freeplay.**

   a. Maximum allowable radial play - **0.020-inch.**

   b. Maximum allowable axial play - **0.063-inch.**

   c. Friction not to restrict freedom of movement on shaft.

   d. Wear or chafing with pitch link, maximum allowable damage depth - **0.015-inch**

7. **Lateral links.** Maximum allowable spherical rod - end bearing play - **0.004-inch.**

8. **Torque link.** Maximum allowable radial and axial play - **0.004-inch.**

9. **Shear pin activated decoupler (SPAD).** Maximum allowable pin hole elongation - **0.002-inch.**

10. **Shear pin activated decoupler (SPAD).** Check anodized surface for galling. None allowed.

11. **Swashplate Inspection - Ball Bearing Condition.**

    a. Inspect for freeplay and smoothness of operation every **50 HOURS.**

       (1) Disconnect pitch links (para 11-3-48), load bearing scissors (para 11-3-43) and secondary scissors (para 11-3-44) at the lower ends.

       (2) Inspect swashplate for smoothness of rotation. If operation is smooth, inspection is complete. If roughness in operation or unusual noise is noted, replace swashplate.

    b. This is a visual inspection accomplished at each **10 HOUR/14 DAY** inspection.

       (1) Visually inspect for condition of parts between rotating and nonrotating swashplate to include seal material, seal retainer plate, lower bearing retaining ring and bearing cage material. If any abnormalities are found, replace swashplate.

GO TO NEXT PAGE

NOTE

A new swashplate bearing is 100% grease filled. It is normal for the bearing to purge excessive grease, at a decreasing rate, for up to 25 flight hours.

(2) Inspect for grease leakage between rotating and nonrotating portions of main rotor swashplate by wiping a finger along the inner circumference of the swashplate for a distance of at least 3 inches in three different locations around the swashplate. A grease film on these parts is normal. If this is observed, inspection is complete. If an abnormal accumulation of grease is deposited on finger, replace swashplate.

c. Check main rotor swashplate clevis and pitch change link rod end for general condition, wear, or chafing.

(1) Blend and finish (TM 43-0105) if wear or chafing in swashplate clevis area does not exceed limits (para 11-3-1).

(2) Replace swashplate (para 11-3-33 and para 11-3-34) if wear of chafing damage in swashplate clevis area exceeds limits (para 11-3-1).

(3) Blend and finish (TM 43-0105) if damage to pitch change link rod ends does not exceed limits (para 11-3-1).

(4) Replace rod end (para 11-3-46) if damage to pitch change link rod end exceeds limits (para 11-3-1).

d. Check helicopters with main rotor swashplate spherical and slider bearings which have chromium oxide-coated (dark brown) spherical balls.

(1) Check spherical ball for flaking.

(2) Replace main rotor swashplate (para 11-3-33 and para 11-3-34) if flaking is visible on surface of spherical ball.

(3) No further action required if blistering (without flaking) is visible on spherical ball.

END OF TASK

11-3-2. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION 11-3-2

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

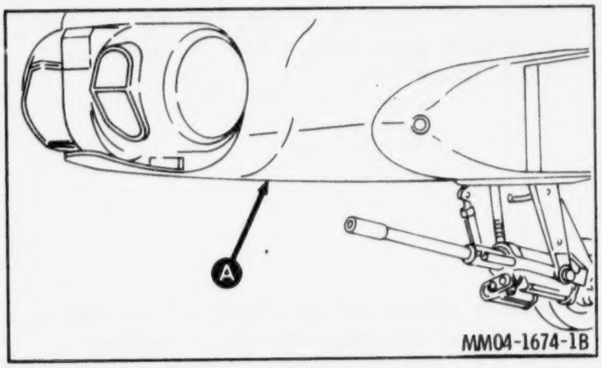
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

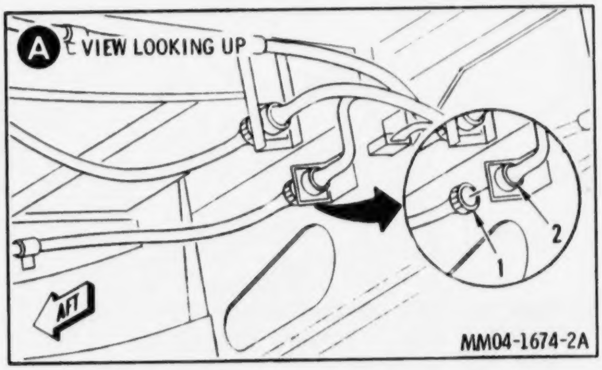
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access door B60 removed

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor





A. REMOVAL

1. **Detach connector P118 (1) from connector J118 (2).**

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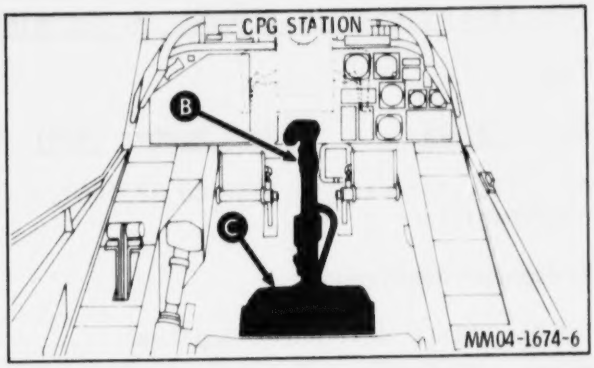
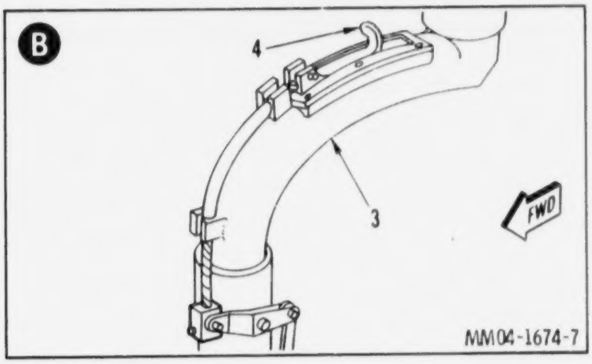
11-3-2. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION (cont) 11-3-2

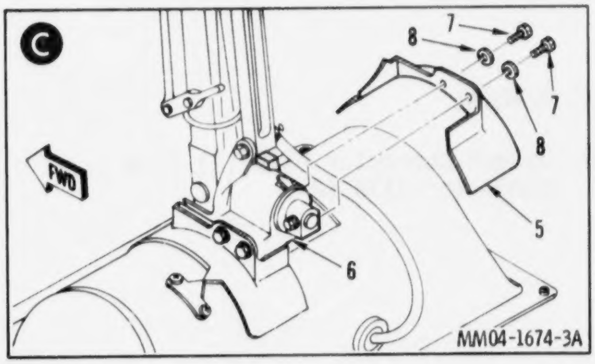

CPG STATION
B
C
MM04-1674-6

2. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

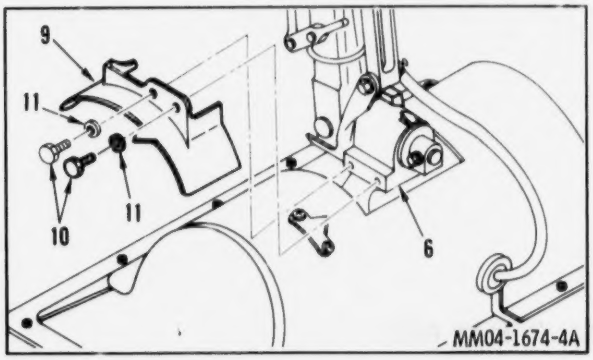
3. **Raise CPG cyclic stick (3) to extended position.** Pull finger lock lever (4).


B
4
3
FWD
MM04-1674-7

4. **Remove right shroud cover (5) from cyclic stick housing (6).** Remove two bolts (7) and two washers (8).


C
7
8
7
8
FWD
5
6
MM04-1674-3A

5. **Remove left shroud cover (9) from housing (6).** Remove two bolts (10) and two washers (11).


9
11
10
11
6
MM04-1674-4A

GO TO NEXT PAGE

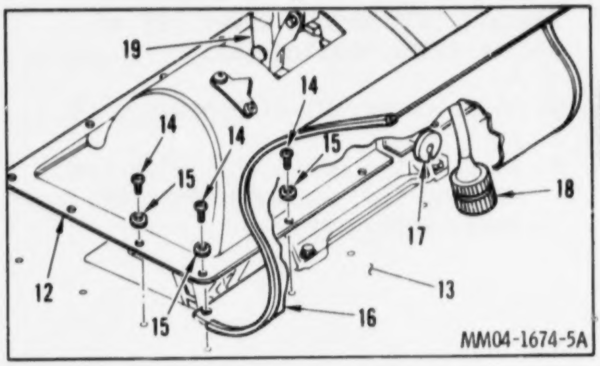
11-3-2. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION (cont) 11-3-2

6. Remove cyclic stick cover (12) from CPG station floor (13).

a. Remove 14 screws (14) and 14 washers (15) from cover (12) and foot guard (16).

b. Remove grommet (17) and cable (18) from cover (12).

c. Remove cover (12) from cyclic stick (19).



B. CLEANING

Wipe cover, foot guard, and attaching area of floor with a clean rag.

C. INSPECTION

1. Check all removed and attaching parts for damage and wear (para 11-3-1).

2. Check all removed and attaching parts for corrosion (para 1-5-38).

D. INSTALLATION

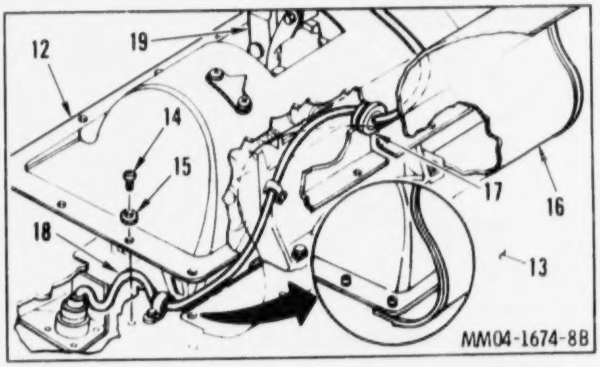
1. Install cyclic stick cover (12) on CPG cyclic stick (19).

a. Position cable (18) in grommet (17).

b. Install grommet (17) in cover (12).

c. Position cover (12) and foot guard (16) on floor (13). Aline mounting holes.

d. Install 14 screws (14) through 14 washers (15), cover (12), foot guard (16), and floor (13).



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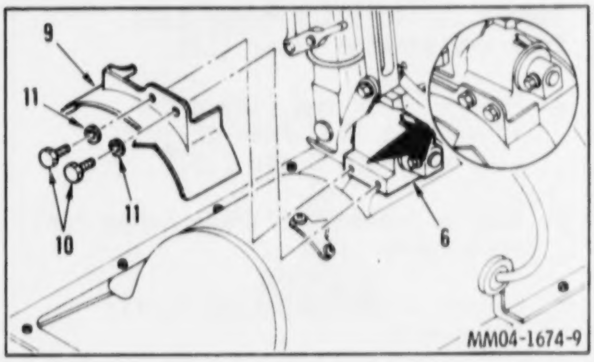
11-3-2. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION (cont) 11-3-2

2. **Install left shroud cover (9) on cyclic stick housing (6).**

   a. Aline cover (9) with housing (6).

   b. Install two bolts (10) with two washers (11) through cover (9) into housing (6).


9
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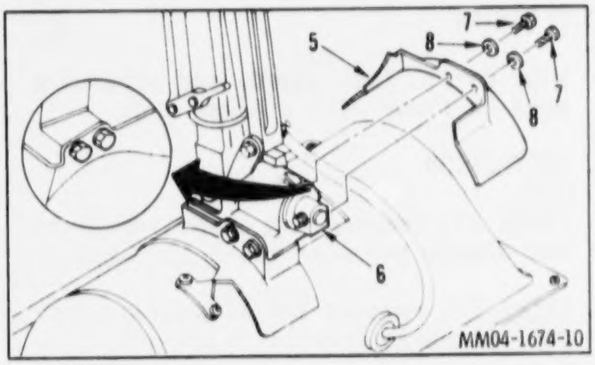
MM04-1674-9

3. **Install right shroud cover (5) on cyclic stick housing (6).**

   a. Aline cover (5) with housing (6).

   b. Install two bolts (7) through two washers (8), and cover (5) into housing (6).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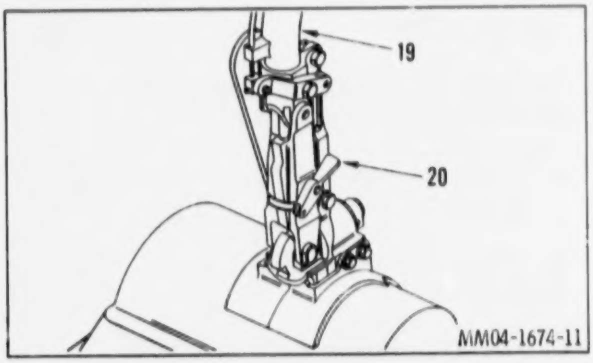
MM04-1674-10

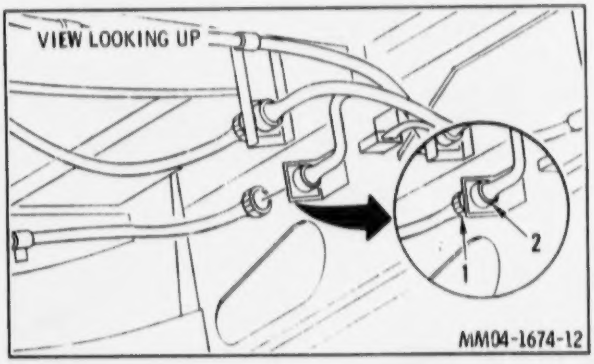
4. **Lower CPG cyclic stick (19) to folded position.** Push lock handle (20) down.


19
20
MM04-1674-11

5. **Attach connector P118 (1) to connector J118 (2).**

6. **Inspect (TI).**

7. **Secure access door B60** (para 2-2-2).


VIEW LOOKING UP
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MM04-1674-12

END OF TASK

11-3-3. CPG CYCLIC STICK AND LATERAL LINK REMOVAL 11-3-3

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

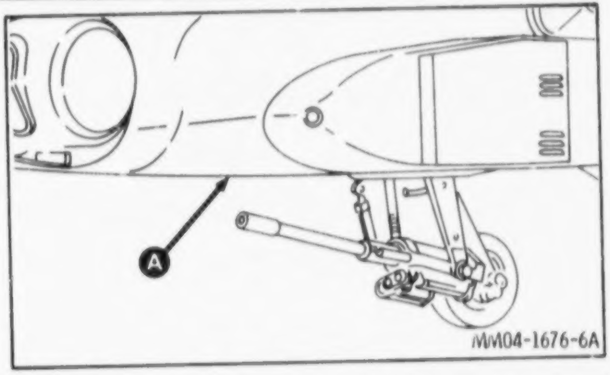
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access door B60 removed
11-3-2	CPG cyclic stick cover removed


A
MM04-1676-6A

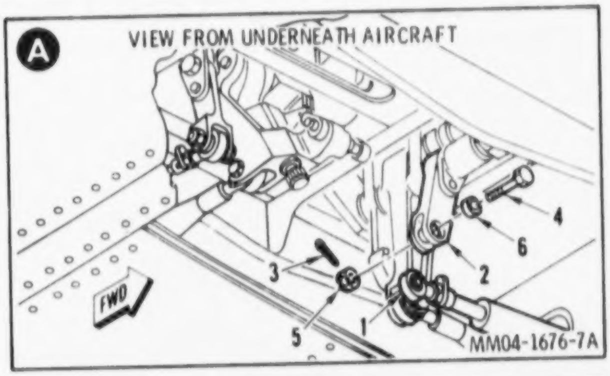
A. REMOVAL

1. **Disconnect lateral transducer (1) from arm (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4) and bushing (6).

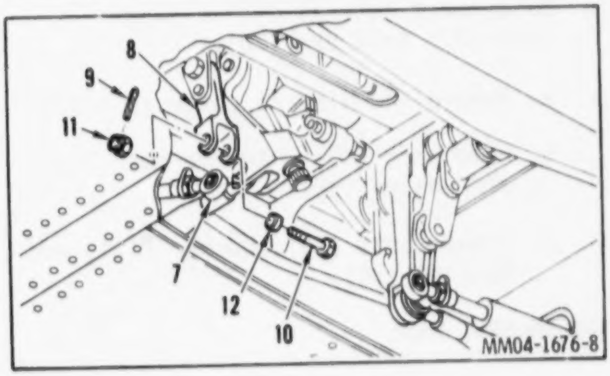

A
VIEW FROM UNDERNEATH AIRCRAFT
4
6
3
2
FWD
1
5
MM04-1676-7A

2. **Disconnect longitudinal transducer (7) from arm (8).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10) and bushing (12).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MM04-1676-8

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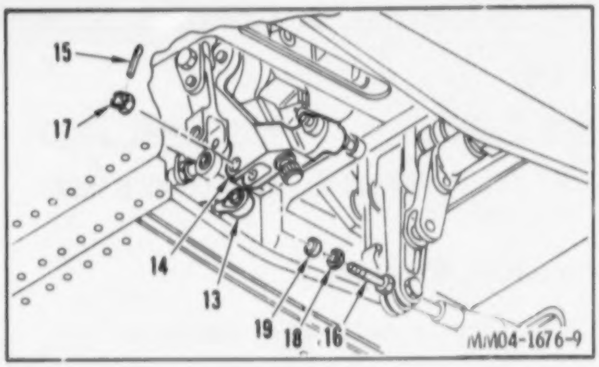
11-3-3. CPG CYCLIC STICK AND LATERAL LINK REMOVAL (cont) 11-3-3

3. **Disconnect longitudinal push-pull rod (13) from yoke (14).**

   a. Remove and discard cotter pin (15).

   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16), washer (18), and bushing (19).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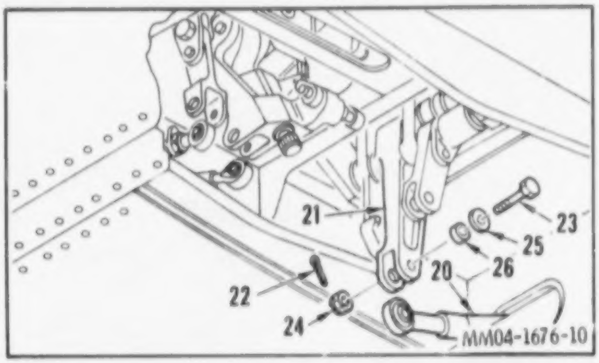
MM04-1676-9

4. **Disconnect lateral push-pull rod (20) from arm (21).**

   a. Remove and discard cotter pin (22).

   b. Hold bolt (23). Remove nut (24).

   c. Remove bolt (23), washer (25), and bushing (26).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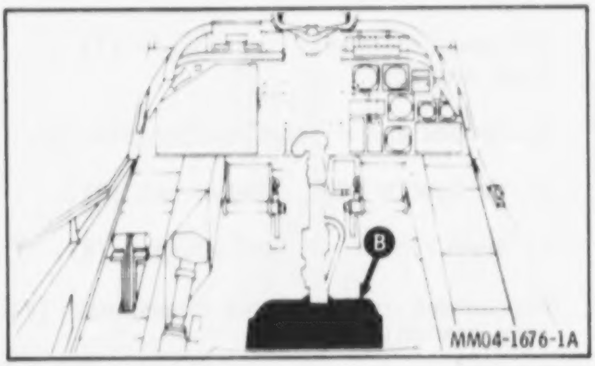
MM04-1676-10

5. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

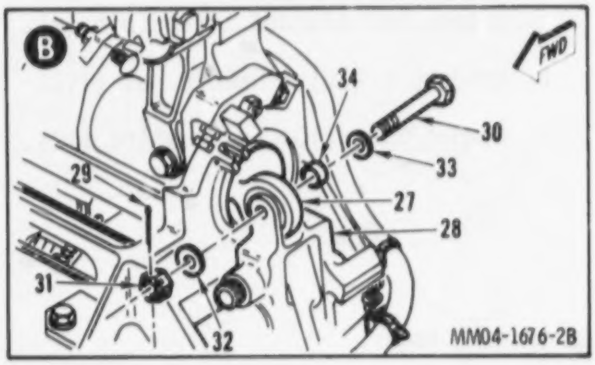

B
MM04-1676-1A

6. **Disconnect lateral cyclic stick link (27) from arm (28).**

   a. Remove and discard cotter pin (29).

   b. Hold bolt (30). Remove nut (31) and washer (32).

   c. Remove bolt (30), washer (33), and bushing (34).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MM04-1676-2B

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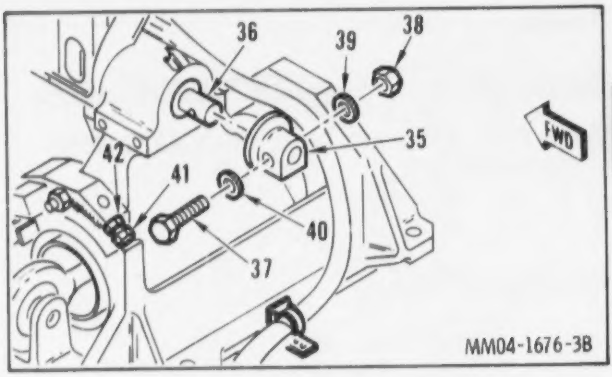
11-3-3. CPG CYCLIC STICK AND LATERAL LINK REMOVAL (cont) 11-3-3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FWD
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MM04-1676-3B

7. Remove retainer (35) from pin (36).

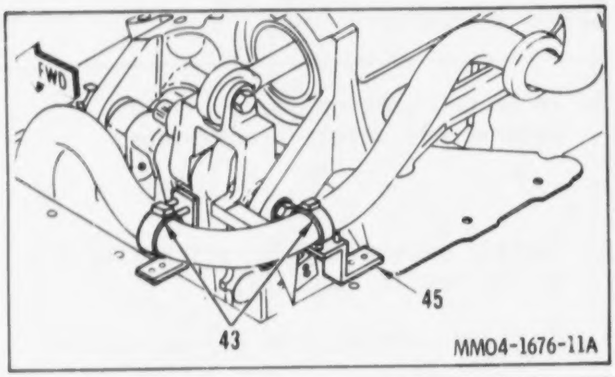
a. Hold bolt (37). Remove nut (38) and washer (39).

b. Remove bolt (37) and washer (40).

8. Remove aft stop bolt (41) and nut (42).

a. Remove lockwire.

b. Loosen nut (42). Remove stop bolt (41) and nut (42).


FWD
45
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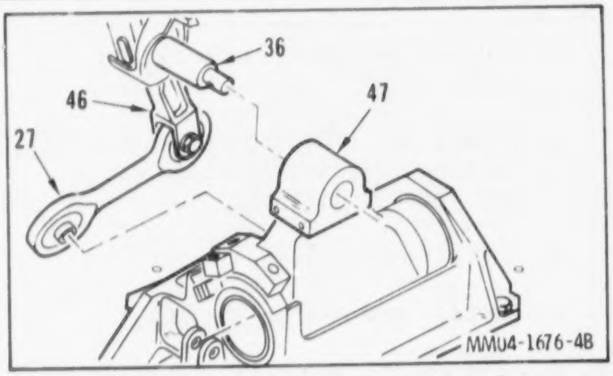
MM04-1676-11A

9. Remove two plastic tie wraps (43) from brackets (44) and (45).

10. Remove cyclic stick (46) with lateral link (27) from housing (47).

a. Hold housing (47) in **FULL AFT** position.

b. Slide stick (46) forward until pin (36) is clear of housing (47).


36
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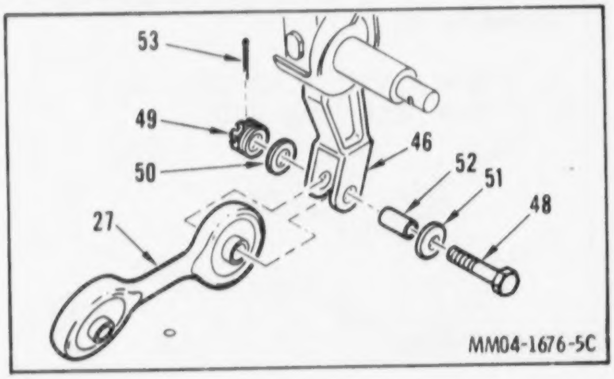
MM04-1676-4B

11. Remove link (27) from cyclic stick (46).

a. Remove and discard cotter pin (53)

b. Hold bolt (48). Remove nut (49) and washer (50).

c. Remove bolt (48), washer (51), and bushing (52).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MM04-1676-5C

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check CPG cyclic stick and lateral link (para 11-3-1).

2. Check CPG cyclic stick and lateral link for corrosion (para 1-5-38).

END OF TASK

11-3-4. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION 11-3-4

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (6)
Plastic Tie Wrap (2)
(E29) Lockwire

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

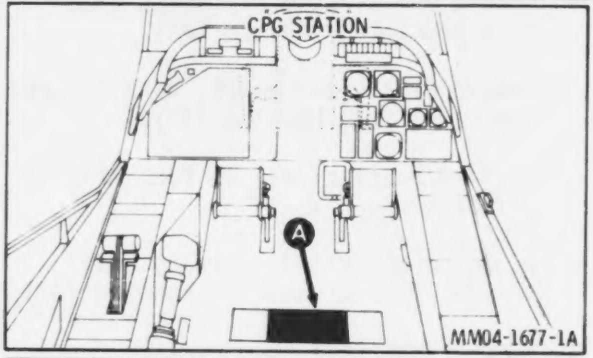
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter CPG station (para 1-7-1). Observe all safety precautions.**



2. **Install lateral cyclic stick link (1) on CPG cyclic stick (2).**

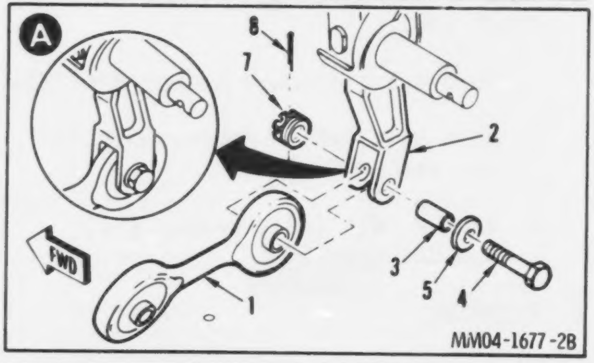
   a. Aline lateral link (1) and cyclic stick (2).

   b. Install bushing (3) in cyclic stick (2).

   c. Insert bolt (4) through washer (5), bushing (3), cyclic stick (2), and lateral link (1).

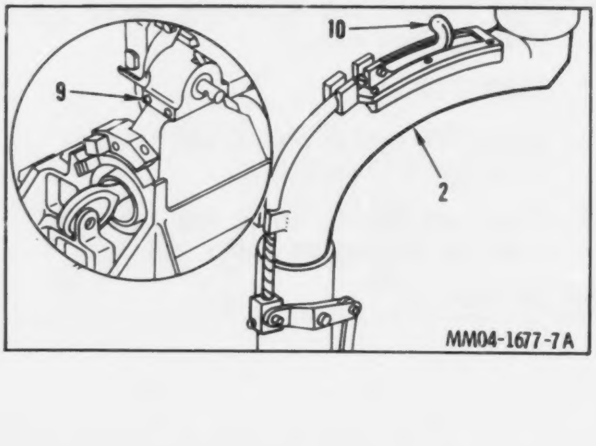
   d. Install nut (7).

   e. Install new cotter pin (8).



3. **Install cyclic stick (2) in housing assembly (9).**

   a. Extend cyclic stick (2). Pull finger lock lever (10).



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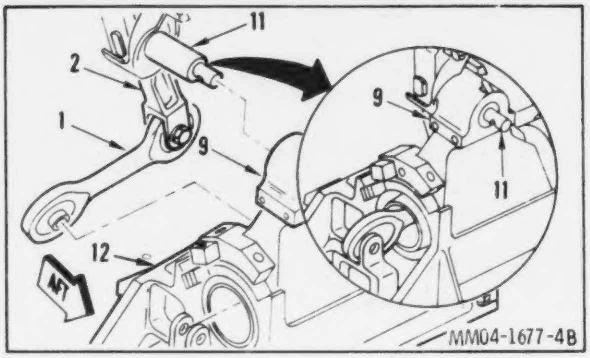
11-3-4. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION (cont) 11-3-4

b. Hold housing (9) in full aft position.

c. Slide pin (11) aft through housing (9) and lateral link (1) in arm (12).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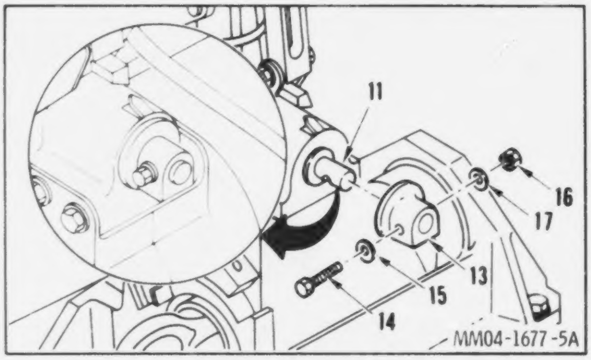
11
12
AFT
MM04-1677-4B

4. **Install retainer (13) on pin (11).**

a. Position retainer (13) on pin (11).

b. Insert bolt (14) through washer (15) and retainer (13).

c. Hold bolt (14). Install washer (17) and nut (16).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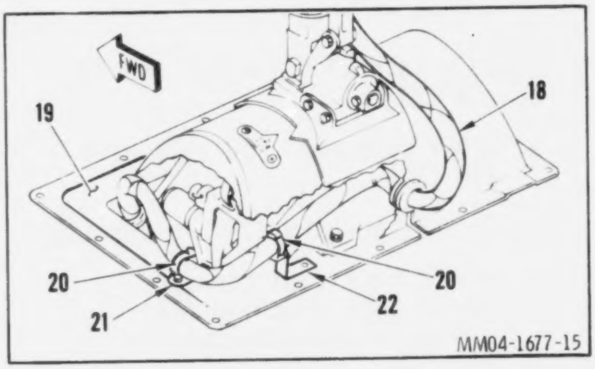
MM04-1677-5A

5. **Fasten two tie wraps (20) to brackets (21) and (22).**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MM04-1677-15

6. **Connect link (1) to arm assembly (12).**

a. Install bushing (23) in arm assembly (12).

b. Insert bolt (24) through washer (25), bushing (23), arm assembly (12), and link (1).

c. Hold bolt (24).

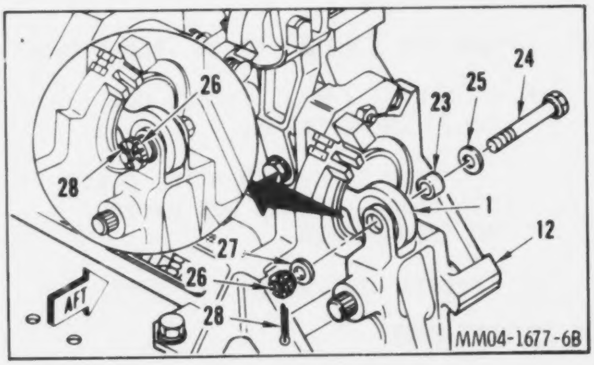
d. Install washer (27) and nut (26).

7. **Torque nut (26) 20 to 25 INCH-POUNDS.**

a. Hold bolt (24). Torque nut (26) to **20 INCH-POUNDS.**

b. Increase torque to aline cotter pin holes, but do not exceed **25 INCH-POUNDS.**

c. Install new cotter pin (28).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MM04-1677-6B

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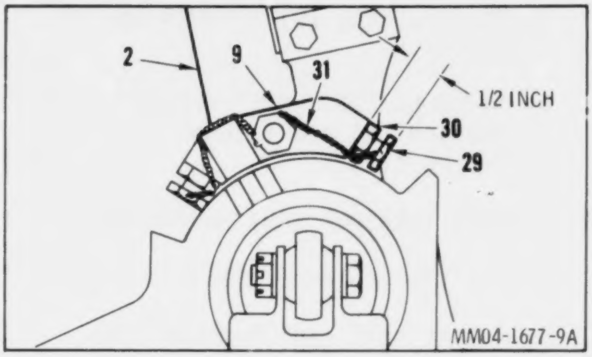
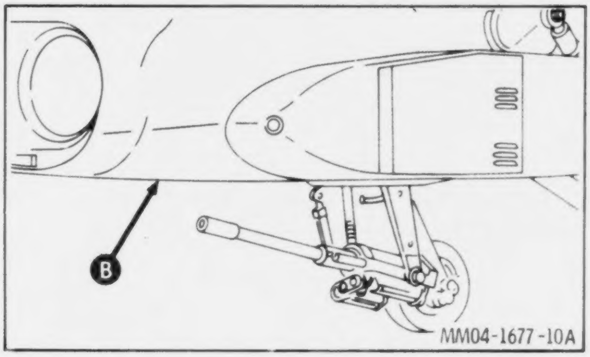
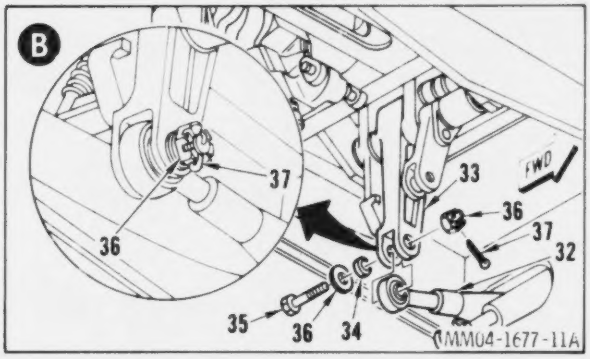
11-3-4. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION (cont) 11-3-4

8. **Install aft stop bolt (29).**
   - a. Hold cyclic stick (2) in full forward position.
   - b. Install aft stop bolt (29) with jam nut (30) in housing (9).
   - c. Adjust length of stop bolt (29) to **1/2-INCH.**
   - d. Hold bolt (29). Tighten jam nut (30).
   - e. Install lockwire (E29) (31).







CAUTION

To prevent damage to control system install bolts with heads in direction as shown.

9. **Connect lateral push-pull rod (32) to arm (33).**
   - a. Aline push-pull rod (32) with arm (33).
   - b. Install bushing (34) in arm (33).
   - c. Insert bolt (35) through washer (36), bushing (34), push-pull rod (32), and arm (33).
10. **Torque nut (36) 30 to 40 INCH-POUNDS.**
   - a. Hold bolt (35). Torque nut (36) to **30 INCH-POUNDS.**
   - b. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   - c. Install new cotter pin (37).

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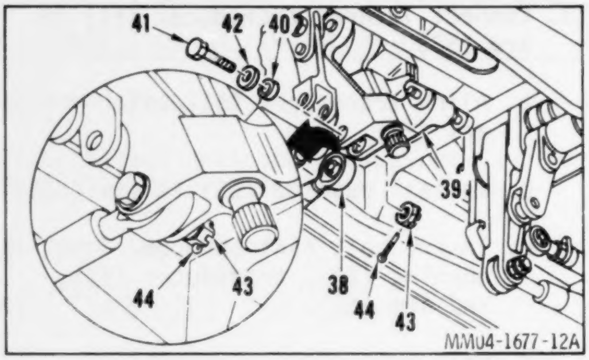
11-3-4. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION (cont) 11-3-4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MM04-1677-12A

11. **Connect longitudinal push-pull rod (38) to yoke (39).**

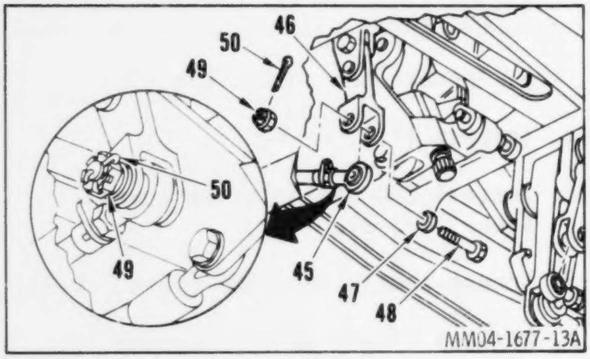
    a. Aline rod (38) with yoke assembly (39).

    b. Install bushing (40) in yoke (39).

    c. Insert bolt (41) through washer (42), bushing (40), rod (38), and yoke (39).

    d. Hold bolt (41). Install nut (43).

    e. Install new cotter pin (44).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MM04-1677-13A

12. **Connect longitudinal transducer (45) to arm (46).**

    a. Aline transducer (45) with arm (46).

    b. Install bushing (47) in arm (46).

    c. Insert bolt (48) through bushing (47), transducer (45) and arm (46).

    d. Hold bolt (48). Install nut (49).

    e. Install new cotter pin (50).

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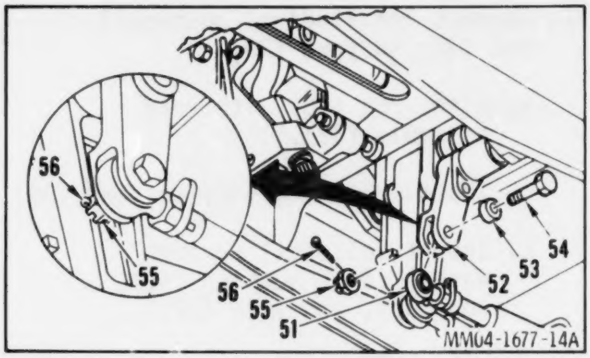
11-3-4. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION (cont) 11-3-4



13. **Connect lateral transducer (51) to arm (52).**
    - a. Aline transducer (51) with arm (52).
    - b. Install bushing (53) in arm (52).
    - c. Insert bolt (54) through bushing (53), transducer (51), and arm (52).
    - d. Hold bolt (54). Install nut (55).
    - e. Install new cotter pin (56).
14. **Inspect (TI).**
15. **Install CPG cyclic stick cover** (para 11-3-2).
16. **Secure access door B60** (para 2-2-2).
17. **Perform flight control system operational check** (TM 55-1520-238-T).

END OF TASK

11-3-5. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION 11-3-5

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

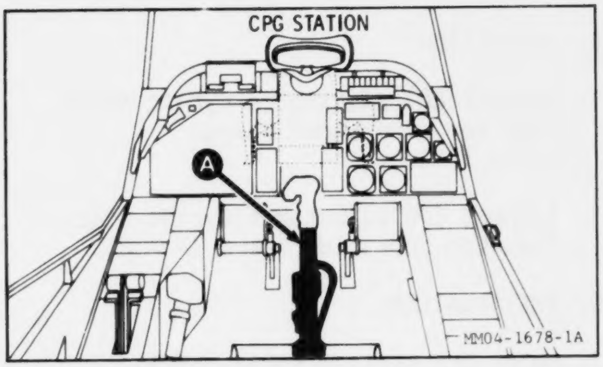
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

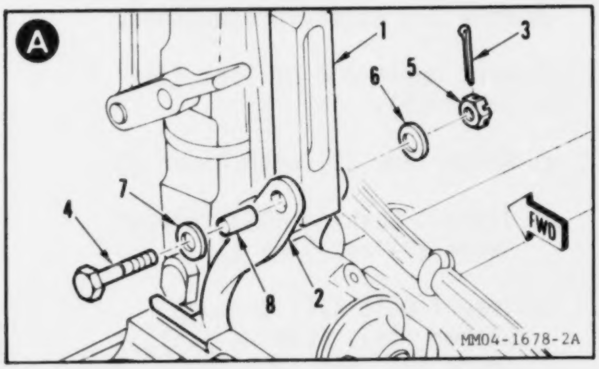
Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**



2. **Disconnect lower end of link (1) from base (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5) and washer (6).
   c. Remove bolt (4), washer (7), and bushing (8).



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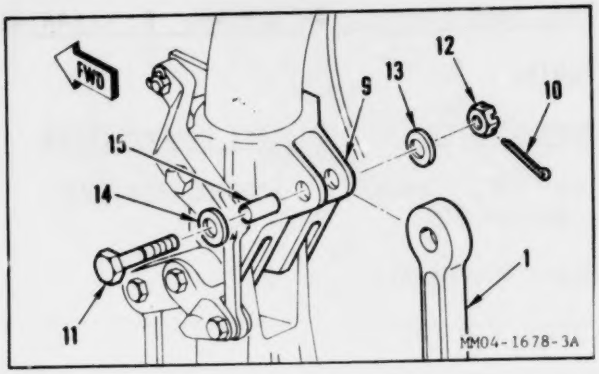
11-3-5. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION (cont) 11-3-5



3. **Disconnect upper end of link (1) from lever (9).**

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11). Remove nut (12) and washer (13).

   c. Remove bolt (11), washer (14), and bushing (15).

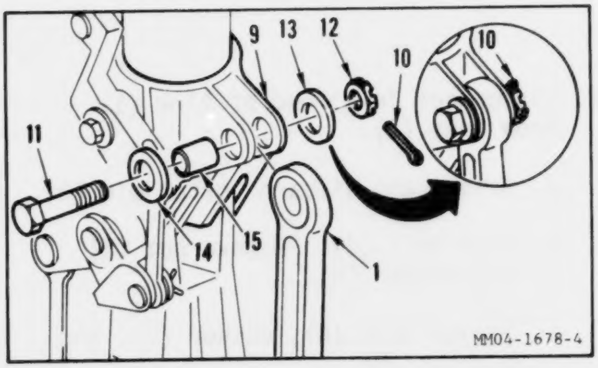
B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Inspect CPG adjustable cyclic stick link for structural damage** (para 11-3-1).

2. **Inspect CPG adjustable cyclic stick link for corrosion** (para 1-5-38).



D. **INSTALLATION**

1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

2. **Connect upper end of link (1) to lever (9).**

   a. Aline link (1) with lever (9).

   b. Install bushing (15) through lever (9) and link (1).

   c. Insert bolt (11) through washer (14), bushing (15), lever (9), and link (1).

   d. Hold bolt (11). Install washer (13) and nut (12).

   e. Install new cotter pin (10).

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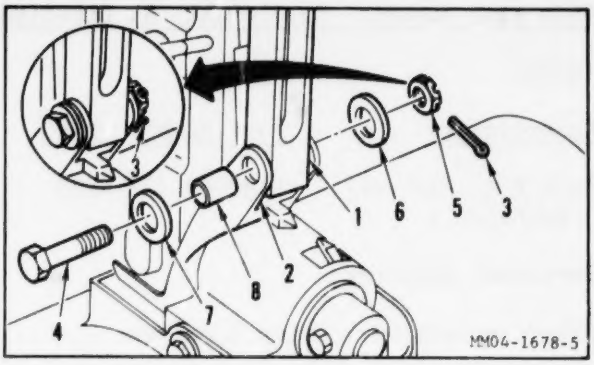
11-3-5. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION (cont) 11-3-5



3. **Connect lower end of link (1) to base assembly (2).**

   a. Aline link (1) with base (2).

   b. Install bushing (8) through base (2) and link (1).

   c. Insert bolt (4) through washer (7), bushing (8), base (2), and link (1).

   d. Hold bolt (4). Install washer (6) and nut (5).

   e. Install new cotter pin (3).

4. **Inspect (TI).**

END OF TASK

11-3-6. CPG CYCLIC STICK FORWARD LINK REMOVAL 11-3-6

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

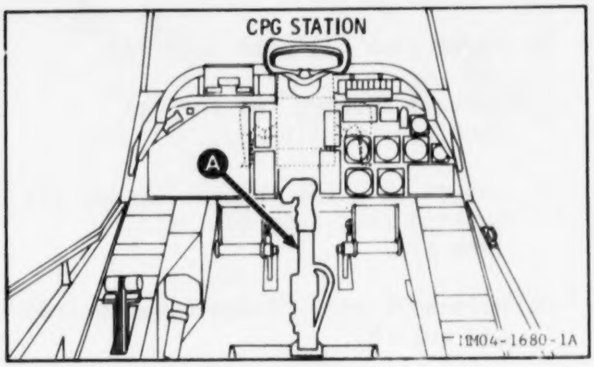
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

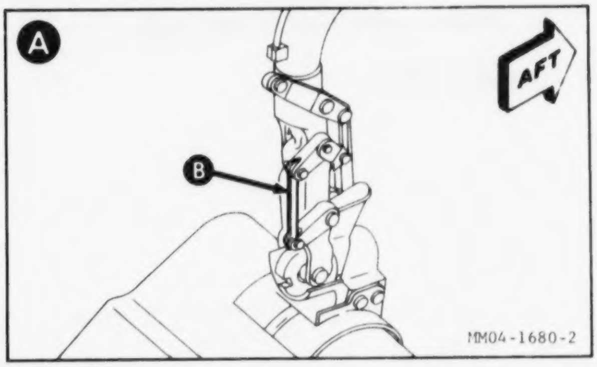
Personnel Required:

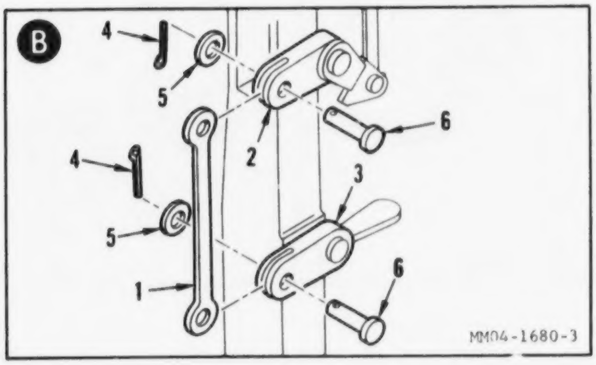
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed







A. REMOVAL

1. **Enter CPG station (para 1-7-1). Observe all safety precautions.**
2. **Remove link (1) from levers (2) and (3).**
   a. Remove and discard two cotter pins (4).
   b. Remove two washers (5).
   c. Remove two pins (6).
   d. Pull link (1) from levers (2) and (3).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check CPG cyclic stick forward link for damage** (para 11-3-1).
2. **Check CPG cyclic stick forward link for corrosion** (para 1-5-38).

END OF TASK

11-3-7. CPG CYCLIC STICK FORWARD LINK INSTALLATION 11-3-7

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

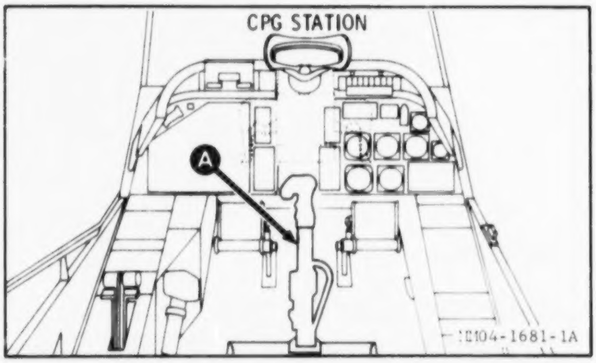
Cotter Pin (2)

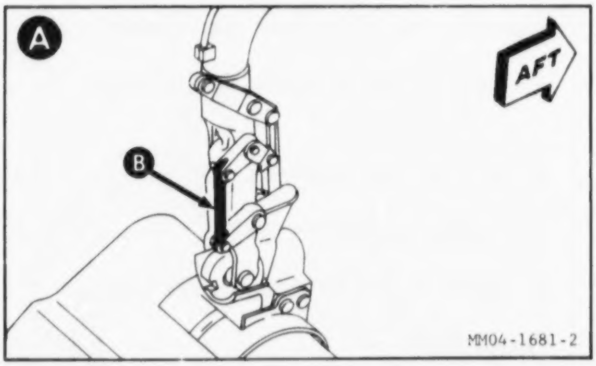
Personnel Required:

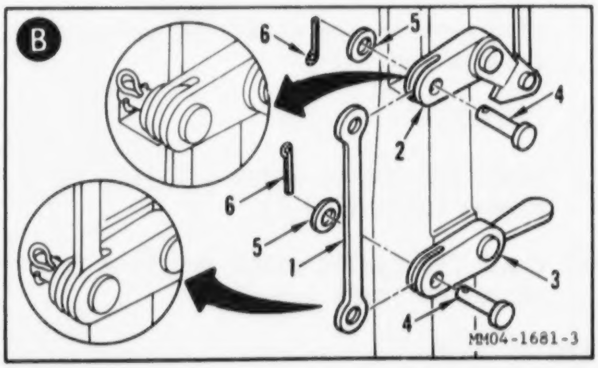
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed







1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

2. **Install link (1) between levers (2) and (3).**

   a. Aline link (1) with levers (2) and (3).

   b. Install two pins (4) through levers (2) and (3) and link (1).

   c. Install two washers (5) on pins (4).

   d. Install two new cotter pins (6) through pins (4).

3. **Inspect (TI).**

END OF TASK

11-3-8. CPG CYCLIC STICK AFT LINK REMOVAL 11-3-8

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

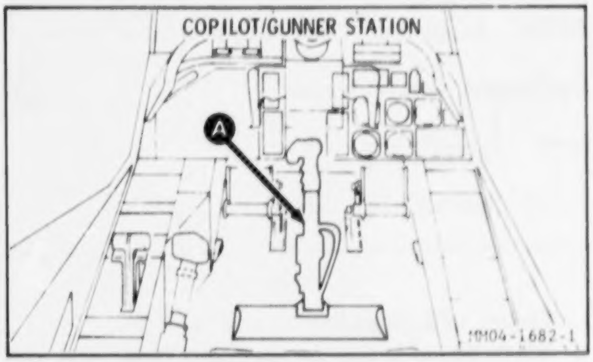
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.
2. Remove link (1) from two levers (2).
   a. Remove and discard two cotter pins (3).
   b. Remove two washers (4).
   c. Remove two pins (5).
   d. Pull link (1) from levers (2).

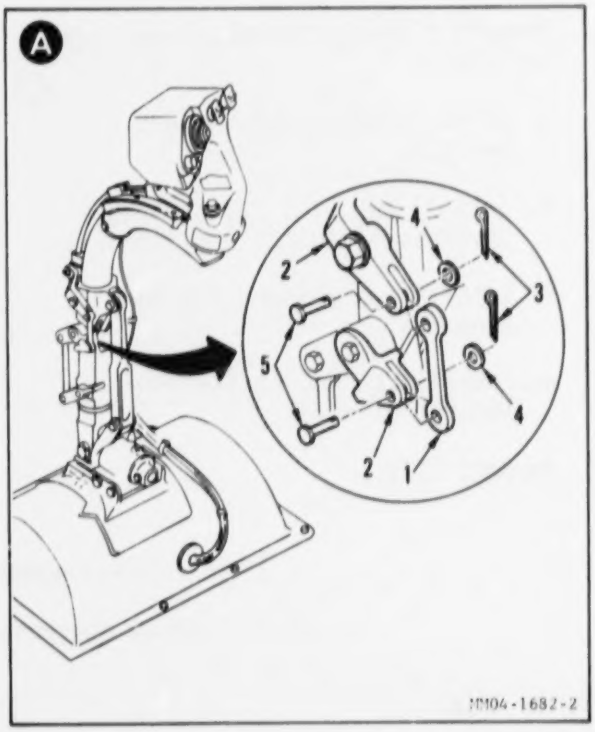
B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check CPG cyclic stick aft link for damage (para 11-3-1).
2. Check CPG cyclic stick aft link for corrosion (para 1-5-38).

END OF TASK



11-3-9. CPG CYCLIC STICK AFT LINK INSTALLATION 11-3-9

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

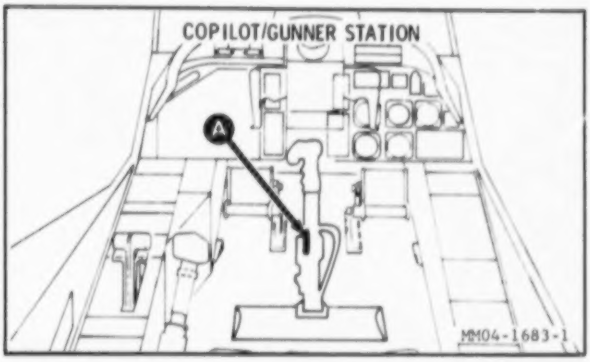
Cotter Pin (2)

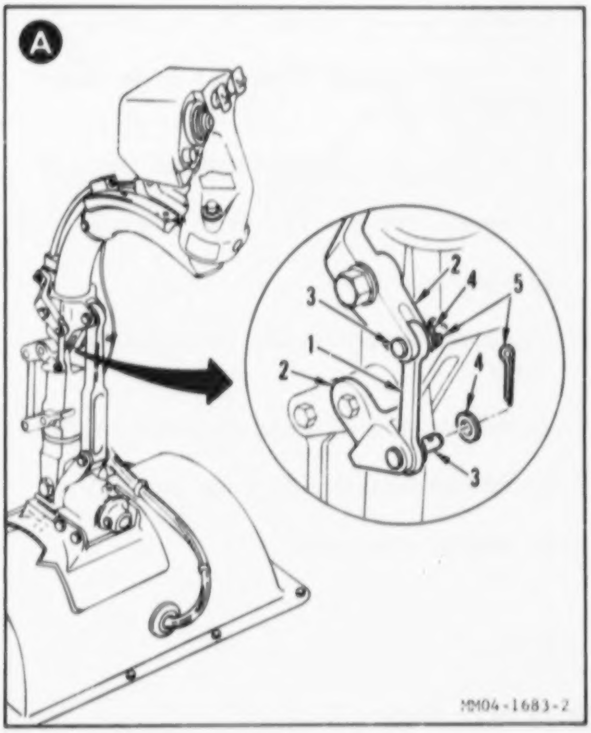
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. Enter CPG station (para 1-7-1). Observe all safety precautions.

2. Install link (1) on two levers (2).

   a. Aline link (1) with two levers (2).

   b. Install two pins (3) through two levers (2) and link (1).

   c. Install two washers (4).

   d. Install two new cotter pins (5) through two pins (3).

3. Inspect (TI).

END OF TASK

11-3-10. CPG LOCK RELEASE LEVER REMOVAL 11-3-10

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

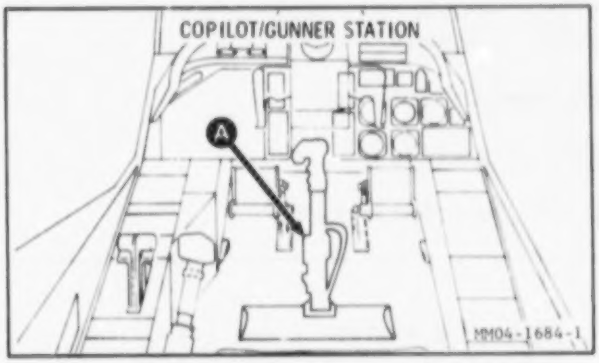
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed


COPILOT/GUNNER STATION
A
MM04-1684-1

A. REMOVAL

1. Disconnect upper link (1) from lever assembly (2).

   a. Remove and discard cotter pin (3).

   b. Remove washer (4) from pin (5).

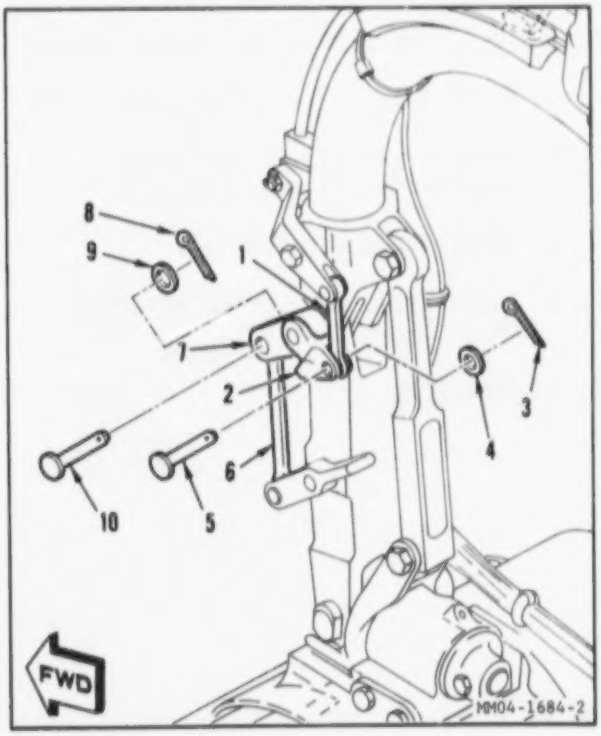
   c. Remove pin (5).

2. Disconnect lower link (6) from idler lever (7).

   a. Remove and discard cotter pin (8).

   b. Remove washer (9) from pin (10).

   c. Remove pin (10).


8
9
1
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FWD
MM04-1684-2

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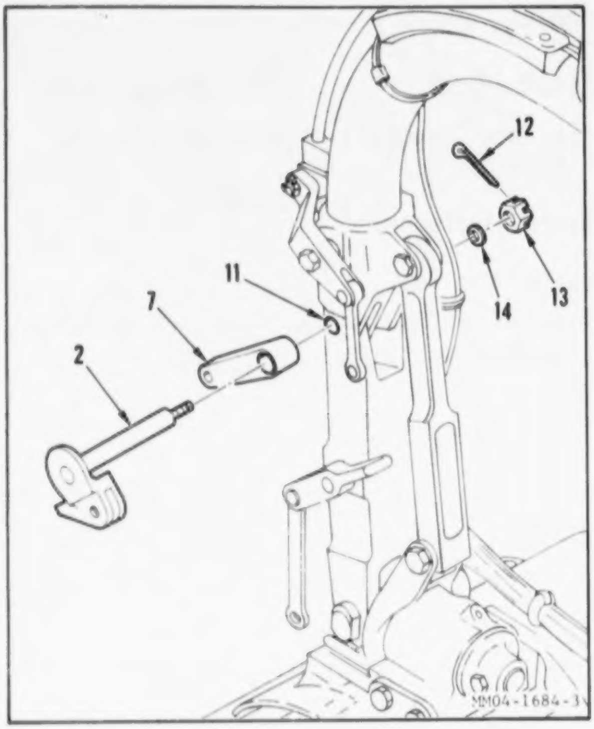
11-3-10. CPG LOCK RELEASE LEVER REMOVAL (cont) 11-3-10

3. **Remove lever (2) with idler lever (7) from fitting (11).**
   - a. Remove and discard cotter pin (12).
   - b. Hold lever (2).
   - c. Remove nut (13) and washer (14).
   - d. Remove lever (2) with idler lever (7) from fitting (11).
4. **Remove idler lever (7) from lever (2).**



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check lever, idler lever, and fitting for damage** (para 11-3-1).
2. **Check lever, idler lever, and fitting for corrosion** (para 1-5-38).

END OF TASK

11-3-11. CPG LOCK RELEASE LEVER INSTALLATION 11-3-11

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

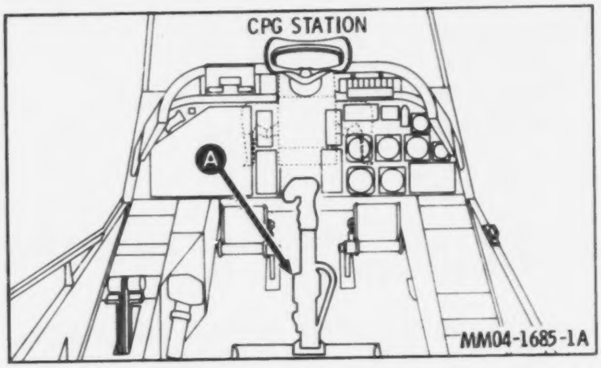
Cotter Pin (3)

Personnel Required:

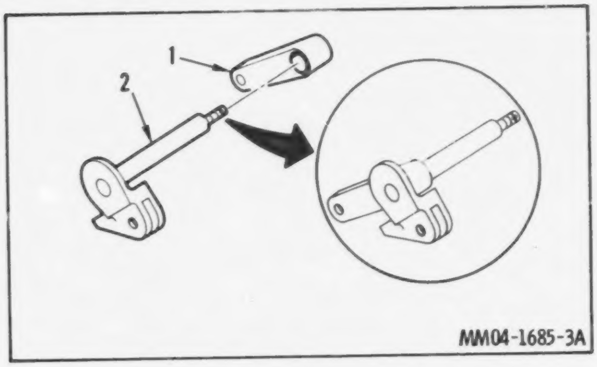
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. Position idler lever (1) on lever (2).



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11-3-11. CPG LOCK RELEASE LEVER INSTALLATION (cont) 11-3-11

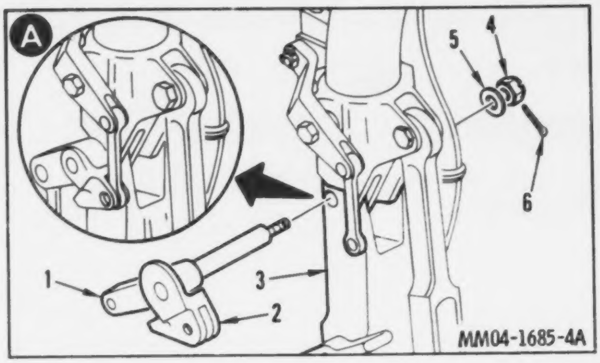
2. **Install lever (2) with idler lever (1) in fitting (3).**

   a. Insert shaft of lever (2) through fitting (3).

   b. Hold lever (2).

   c. Install washer (5) and nut (4).

   d. Install new cotter pin (6).



3. **Connect upper link (7) to lever (2)**

   a. Put link (7) inside lever (2) and aline mounting holes.

   b. Install pin (8) through lever (2) and link (7).

   c. Install washer (9) on pin (8).

   d. Install new cotter pin (10) through pin (8).

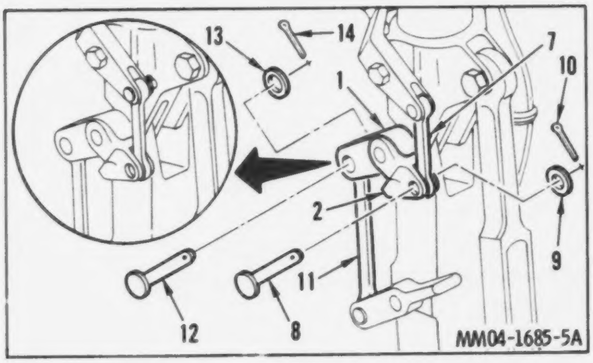
4. **Connect lower link (11) to idler lever (1).**

   a. Put link (11) inside idler lever (1) and aline mounting holes.

   b. Install pin (12) through idler lever (1) and link (11).

   c. Install washer (13) on pin (12).

   d. Install new cotter pin (14) through pin (12).



5. **Inspect (TI).**

END OF TASK

11-3-12. CPG CYCLIC STICK REMOTE CONTROL LEVER REMOVAL 11-3-12

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

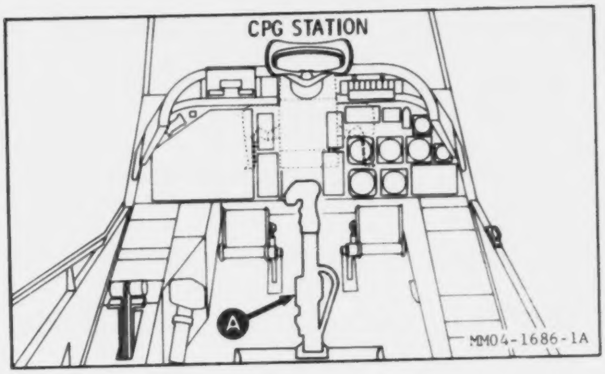
67R10 Attack Helicopter Repairer

Equipment Conditions:

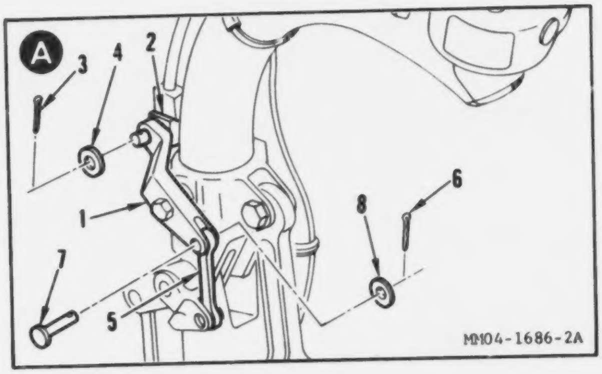
Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.



2. **Disconnect lever (1) from upper fitting (2).**
   a. Remove and discard cotter pin (3).
   b. Remove washer (4).
3. **Disconnect lever (1) from link (5).**
   a. Remove and discard cotter pin (6).
   b. Remove pin (7) and washer (8).



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11-3-12. CPG CYCLIC STICK REMOTE CONTROL LEVER REMOVAL (cont) 11-3-12

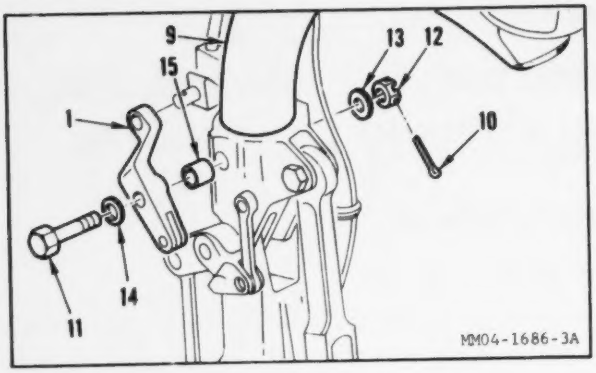
4. **Remove lever (1) from cyclic stick assembly (9).**

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11).

   c. Remove nut (12) and washer (13).

   d. Remove bolt (11), washer (14), lever (1), and bushing (15).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Inspect cyclic stick assembly, lever, and link for damage** (para 11-3-1).

2. **Check cyclic stick assembly, lever, and link for corrosion** (para 1-5-38).

END OF TASK

11-3-13. CPG CYCLIC STICK REMOTE CONTROL LEVER INSTALLATION 11-3-13

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (3)

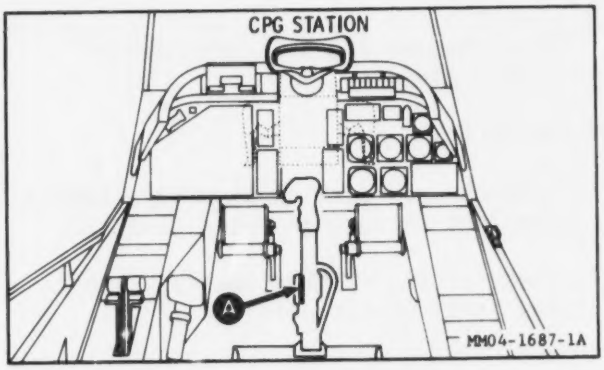
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

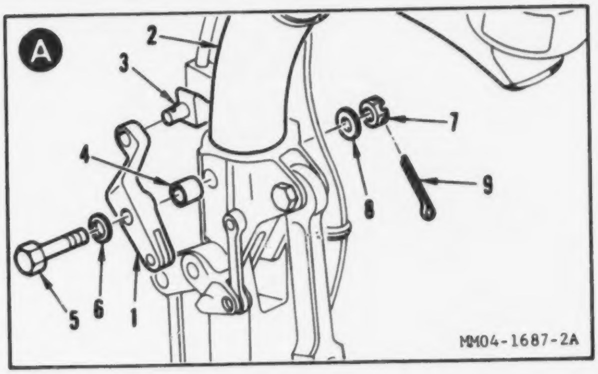
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**



2. **Install lever (1) on cyclic stick assembly (2).**
   - a. Aline lever (1) with stick assembly (2) and fitting (3).
   - b. Install bushing (4) on lever (1).
   - c. Insert bolt (5) through washer (6), lever (1), bushing (4), and stick assembly (2).
   - d. Hold bolt (5).
   - e. Install washer (8) and nut (7).
   - f. Install new cotter pin (9).



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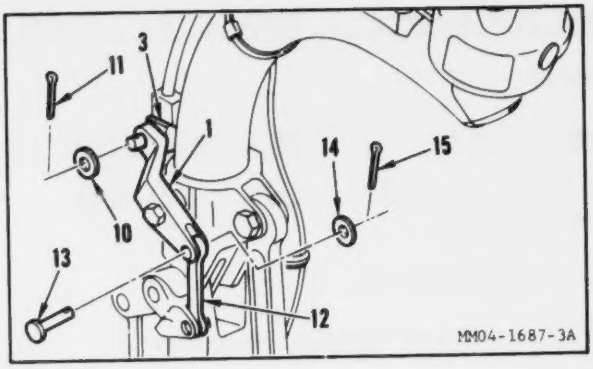
11-3-13. CPG CYCLIC STICK REMOTE CONTROL LEVER INSTALLATION (cont) 11-3-13



3. **Connect lever (1) to fitting (3).**
   a. Position washer (10) on fitting (3).
   b. Install new cotter pin (11) through fitting (3).
4. **Connect link (12) to lever (1).**
   a. Aline link (12) with lever (1).
   b. Insert pin (13) through lever (1) and link (12).
   c. Install washer (14) on pin (13).
   d. Install new cotter pin (15) through pin (13).
5. **Inspect (TI).**

END OF TASK

11-3-14. CPG CYCLIC STICK WIRE ROPE RELEASE FITTING REMOVAL 11-3-14

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

1. **Remove fitting (1) from lever (2).**
   a. Remove and discard cotter pin (3).
   b. Remove washer (5), fitting (1), and cable (4), from lever (2).
2. **Remove fitting (1) from cable (4).**
   a. Remove and discard cotter pin (6).
   b. Separate fitting (1) from cable (4).

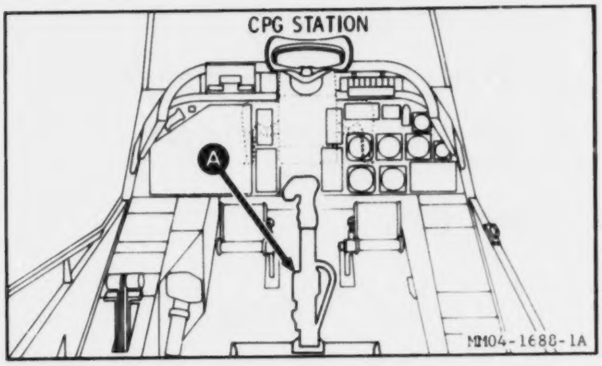
B. CLEANING

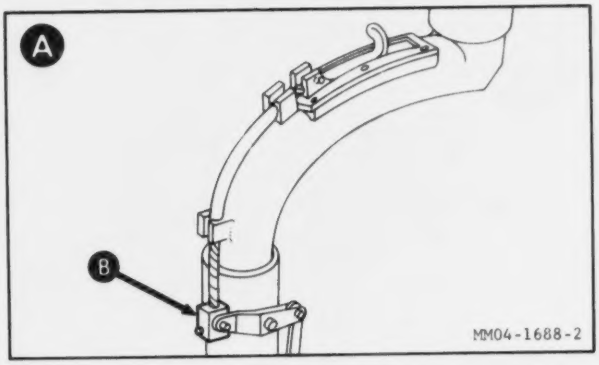
Wipe removed and attaching parts with a clean rag.

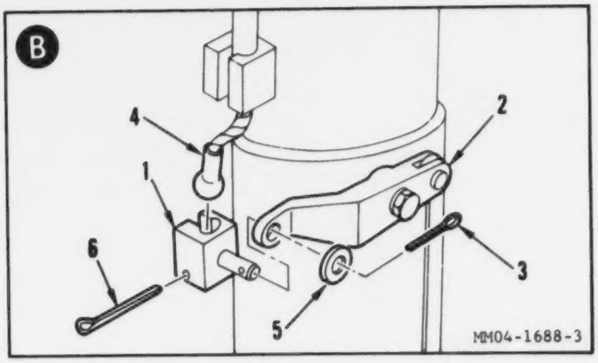
C. INSPECTION

1. **Check wire rope release fitting and cable end for damage and fraying (para 11-3-1).**
2. **Check wire rope release fitting and cable for corrosion (para 1-5-38).**

END OF TASK







11-3-15. CPG CYCLIC STICK WIRE ROPE RELEASE FITTING INSTALLATION 11-3-15

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

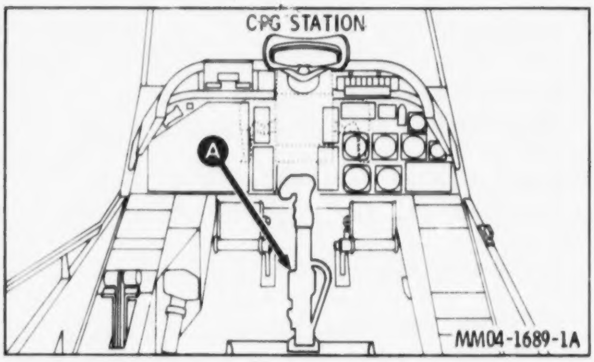
Cotter Pin (2)

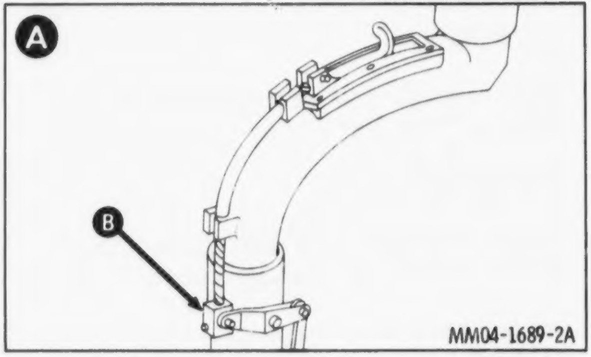
Personnel Required:

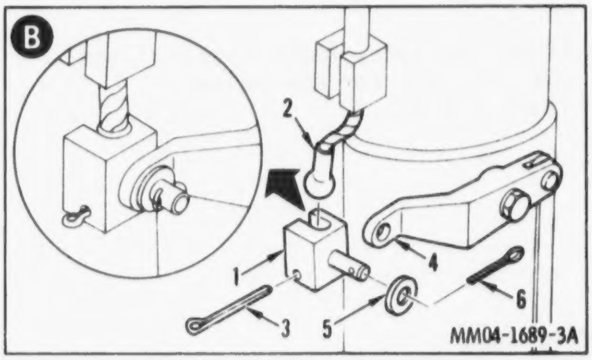
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed







1. **Install fitting (1) on cable (2).**
   a. Install fitting (1) on end of cable (2).
   b. Install new cotter pin (3).
2. **Connect fitting (1) with cable (2) to lever (4).**
   a. Insert fitting (1) through lever (4).
   b. Install washer (5) on fitting (1).
   c. Install new cotter pin (6).
3. **Inspect (TI).**

END OF TASK

11-3-16. CPG CYCLIC STICK LEVER LOCK RELEASE RETAINER REMOVAL 11-3-16

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

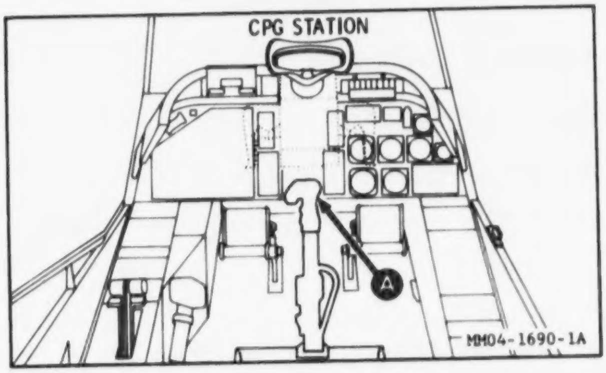
67R10 Attack Helicopter Repairer

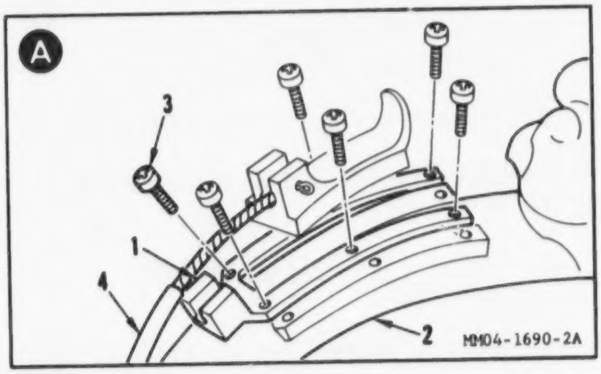
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.
2. Remove lever lock release retainer (1) from cyclic stick (2).
   - a. Remove six screws (3).
   - b. Slide retainer (1) free of cable housing (4).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check retainer, cable housing, and cyclic stick for damage (para 11-3-1).
2. Check cable for fraying. None allowed.
3. Check retainer, cable housing, and cyclic stick for corrosion (para 1-5-38).

END OF TASK

11-3-17. CPG CYCLIC STICK LEVER LOCK RELEASE RETAINER INSTALLATION 11-3-17

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

(E46) Sealing Compound

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

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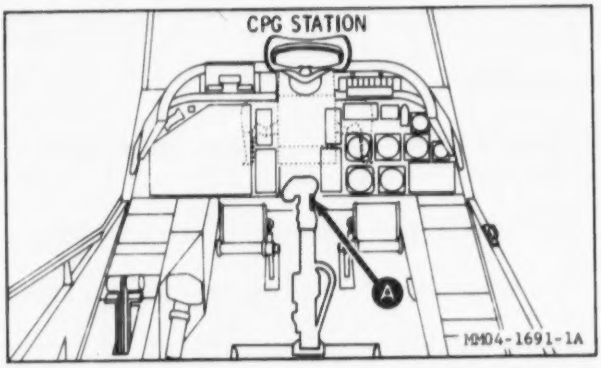
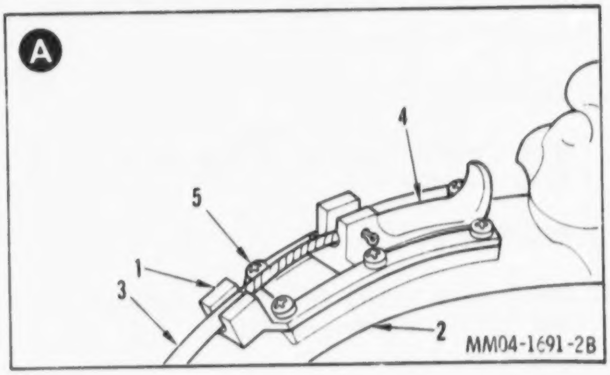
1. **Enter CPG station (para 1-7-1). Observe all safety precautions.**



2. **Install finger lock release retainer (1) on cyclic stick (2).**
   a. Slide retainer (1) on cable housing (3).
   b. Position release retainer (1) on cyclic stick (2) so that finger lock release lever (4) is captured against cyclic stick (2).
   c. Apply sealing compound (E46) to threads of six screws (5).
   d. Install six screws (5).



3. **Inspect (TI).**

END OF TASK

11-3-18. CPG CYCLIC STICK LOCK RELEASE WIRE ROPE REMOVAL 11-3-18

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-14	CPG cyclic stick wire rope release retainer removed
11-3-16	CPG cyclic stick lever lock release retainer removed

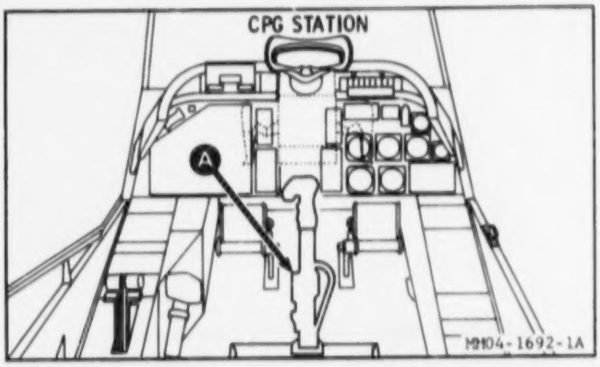
A. REMOVAL

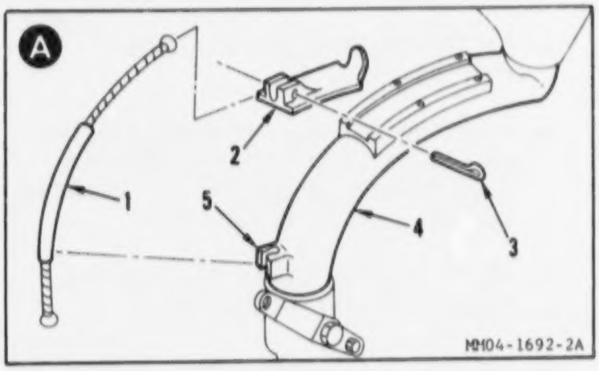
1. Remove wire rope (1) from lever lock release retainer (2).

   a. Remove and discard cotter pin (3).

   b. Slide lever (2) free of cable (1).

2. Remove cable (1) from cyclic stick (4) by sliding it out of support (5).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check wire rope, retainer, support, and cyclic stick for damage (para 11-3-1).

2. Check wire rope for fraying. None allowed.

3. Check wire rope, retainer, support, and cyclic stick for corrosion (para 1-5-38).

END OF TASK

11-3-19. CPG CYCLIC STICK LOCK RELEASE WIRE ROPE INSTALLATION 11-3-19

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

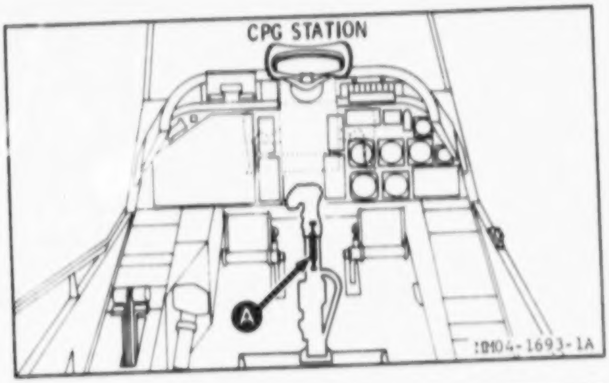
Cotter Pin

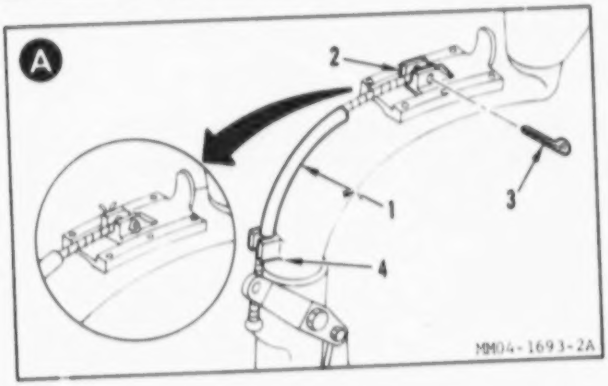
Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Connect wire rope (1) to lever lock release retainer (2).**
   - a. Slide lever (2) on end of cable (1).
   - b. Install new cotter pin (3).
2. **Install cable (1) in cyclic stick cable support (4).**
3. **Install lever lock release retainer** (para 11-3-17).
4. **Install cyclic stick wire rope release fitting** (para 11-3-15).
5. **Inspect (TI).**

END OF TASK

11-3-20. CPG CYCLIC STICK LOCK REMOVAL 11-3-20

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

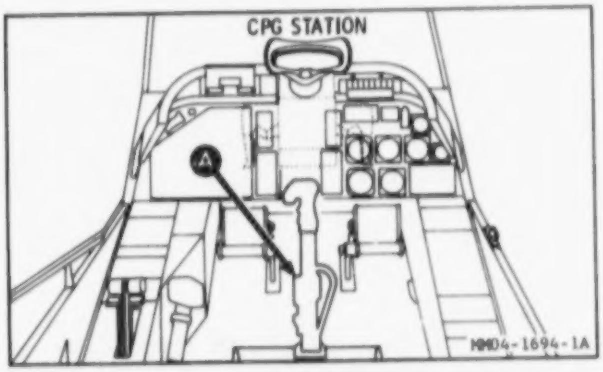
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

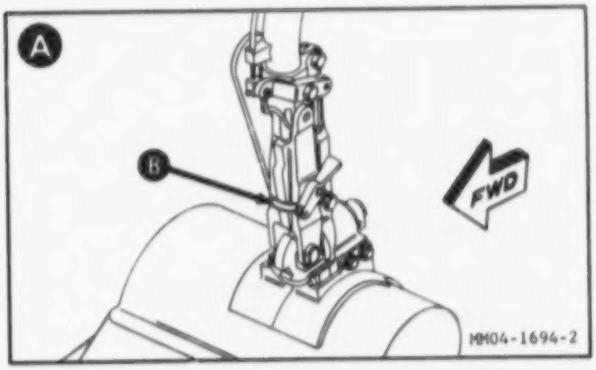
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-5	Link assembly removed
11-3-6	Cyclic stick forward link removed
11-3-10	Lock release lever removed





A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.

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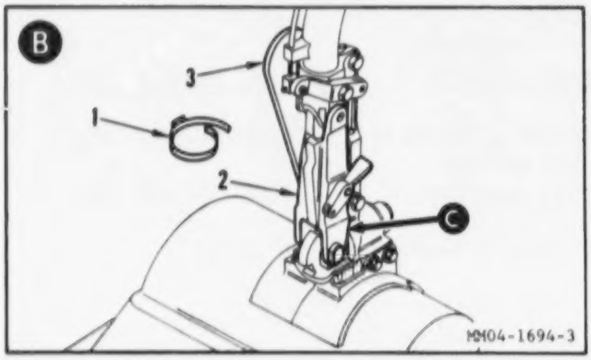
11-3-20. CPG CYCLIC STICK LOCK REMOVAL (cont) 11-3-20

2. **Remove tiedown strap (1) from lock (2) and wire bundle (3).** Cut strap (1).



3. **Remove lock (2) from base (4).**

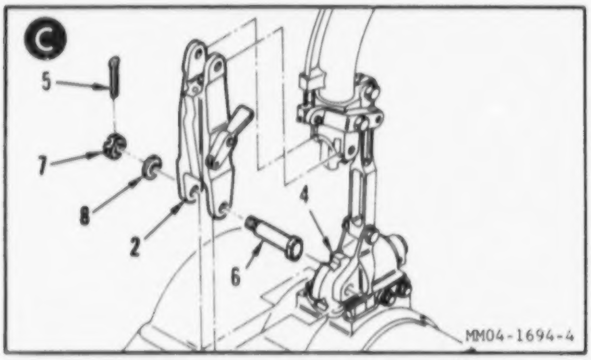
   a. Remove and discard cotter pin (5).

   b. Hold bolt (6).

   c. Remove nut (7) and washer (8).

   d. Remove bolt (6).

   e. Pull lock (2) from base (4).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check lock assembly, wire bundle, and base for damage** (para 11-3-1).

2. **Check lock assembly, wire bundle, and base for corrosion** (para 1-5-38).

END OF TASK

11-3-21. CPG CYCLIC STICK LOCK INSTALLATION 11-3-21

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Tool, Installing	5120-00-781-7891

Materials/Parts:

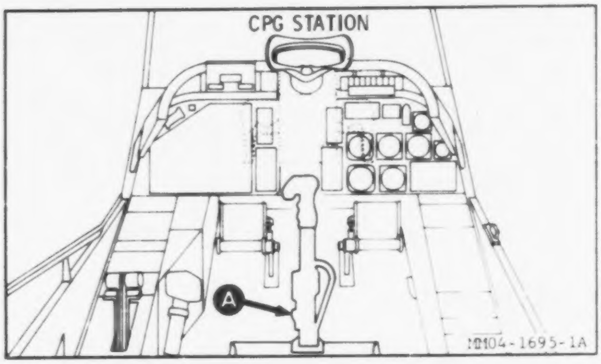
	Cotter Pin
(E106)	Tiedown Strap

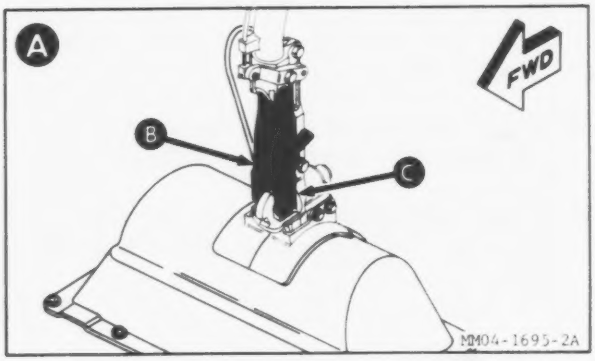
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. Enter CPG station (para 1-7-1). Observe all safety precautions.

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2. **Install lock (1) on base (2).**

   a. Aline lock assembly (1) with base assembly (2).

   b. Insert bolt (3) through base (2) and lock (1).

   c. Hold bolt (3).

   d. Install washer (5) and nut (4).

   e. Install new cotter pin (6).

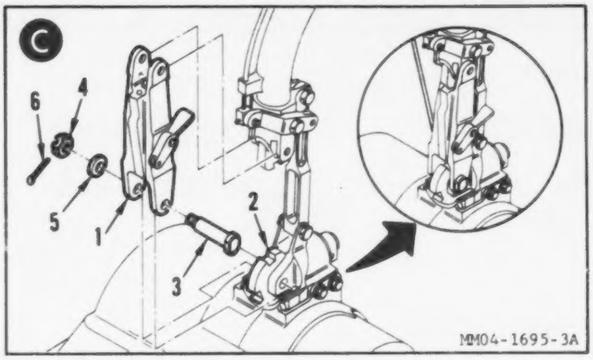
3. **Install lock release lever** (para 11-3-11).

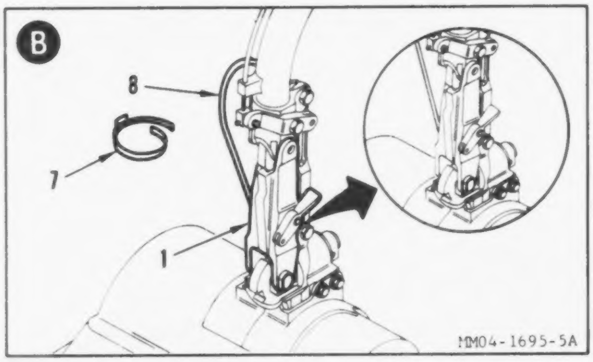
4. **Install cyclic stick forward link** (para 11-3-7).

5. **Install link** (para 11-3-5).

6. **Install tiedown strap (7) around lock (1) and wire bundle (8).** Use installing tool.

7. **Inspect (TI).**





END OF TASK

11-3-22. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION 11-3-22

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

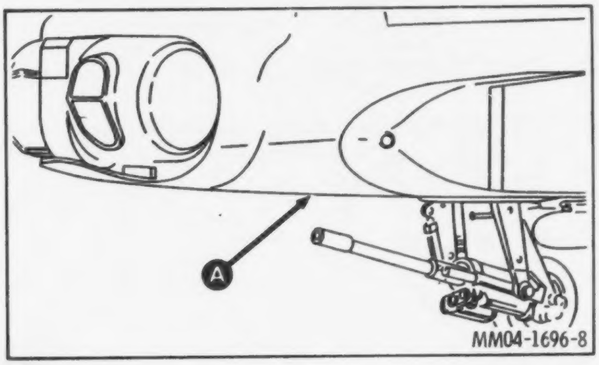
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

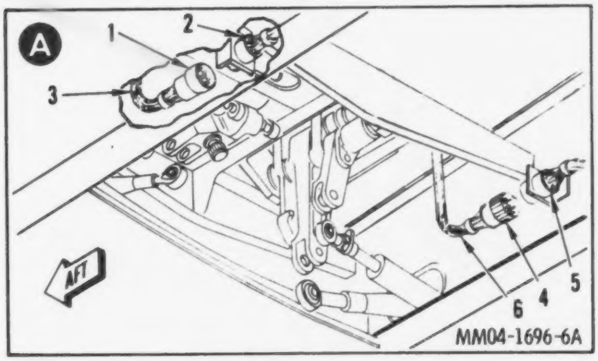
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-2	CPG cyclic stick cover removed
2-2-2	Access cover B60 opened
11-3-3	CPG cyclic stick and lateral link assembly removed





A. REMOVAL

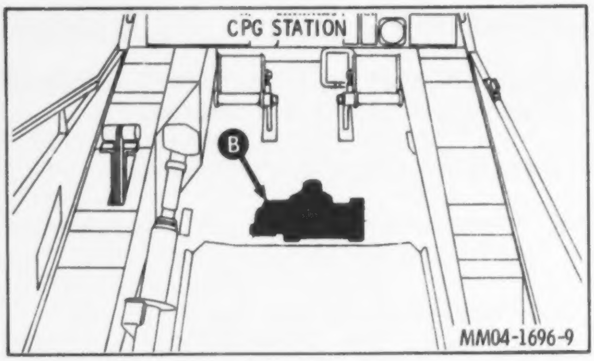
1. **Detach connector A334P1 (1) from connector J267 (2).** Identify cyclic longitudinal cable (3).

2. **Detach connector A334P1 (4) from connector J266 (5).** Identify cyclic lateral cable (6).

GO TO NEXT PAGE

11-3-22. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION (cont) 11-3-22

3. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

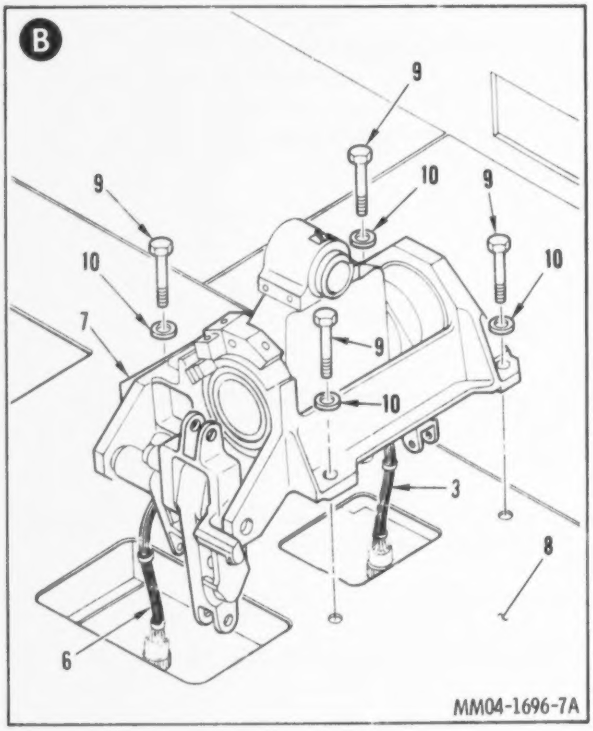

CPG STATION
B
MM04-1696-9

4. **Remove housing (7) from floor (8).**

   a. Remove four bolts (9) and four washers (10).

   b. Lift housing (7) straight up from floor (8).

   c. Remove longitudinal cable (3) and lateral cable (6) with housing (7).


B
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MM04-1696-7A

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check housing and cables for damage** (para 11-3-1).

2. **Check housing and cables for corrosion** (para 1-5-38).

GO TO NEXT PAGE

11-3-22. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION (cont) 11-3-22

D. INSTALLATION

1. Enter CPG station (para 1-7-1). Observe all safety precautions.

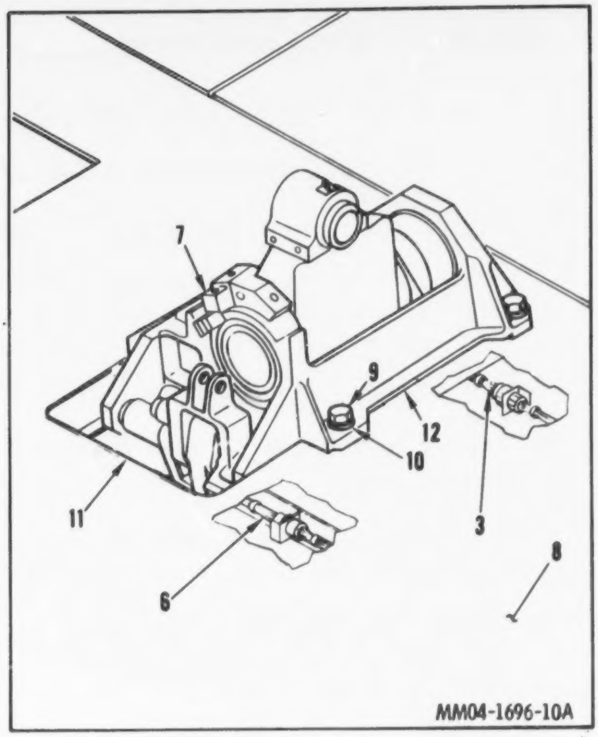
2. Install housing (7) on floor (8).

   a. Place lateral cable (6) through left opening (11) in floor (8).

   b. Place longitudinal cable (3) through right opening (12) in floor (8).

   c. Position housing (7) on floor (8). Aline mounting holes.

   d. Install four washers (10) and four bolts (9).



3. Attach connector A334P1 (1) of longitudinal cable (3) to connector J267 (2).

4. Attach connector A334P1 (4) of lateral cable (6) to connector J266 (5).

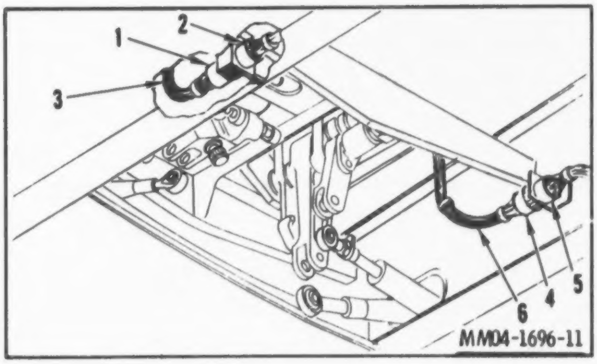
5. Inspect (TI).

6. Install CPG cyclic stick and lateral link (para 11-3-4).

7. Install CPG cyclic stick cover (para 11-3-2).

8. Secure access cover B60 (para 2-2-2).

9. Perform flight control system operational check (TM 55-1520-238-T).



END OF TASK

11-3-23. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT 11-3-23

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Shear Pin
(E16)	Petrolatum
(E34)	Lockwire

Personnel Required:

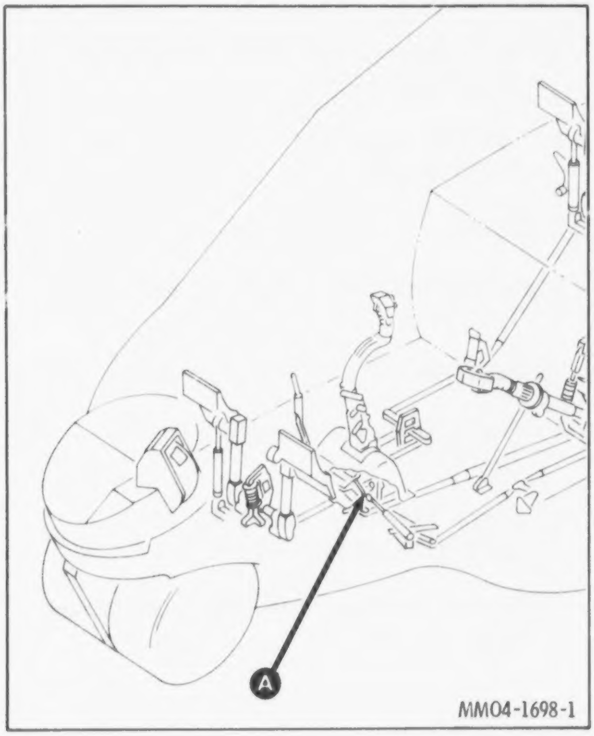
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access cover B60 removed



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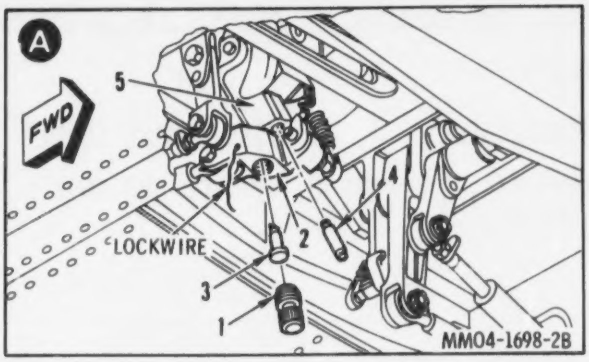
11-3-23. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT (cont) 11-3-23

A. REMOVAL



1. **Remove shear pin retainer (1) from arm (2).**

   a. Remove lockwire.

   b. Unscrew retainer (1).

   NOTE

   Shear pin must be removed in pieces if sheared.

2. **Remove shear pin half (3) from arm (2).**

3. **Remove shear pin half (3) from housing (5).**

   a. Move arm (2) to allow access to shear pin (4).

   b. Remove shear pin half (4) from housing (5).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check SPAD for damage** (para 11-3-1).

2. **Check retainer and SPAD for corrosion** (para 1-5-38).

3. **Check retainer for damaged threads.** None allowed.

GO TO NEXT PAGE

11-3-23. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT (cont) 11-3-23

D. INSTALLATION

NOTE

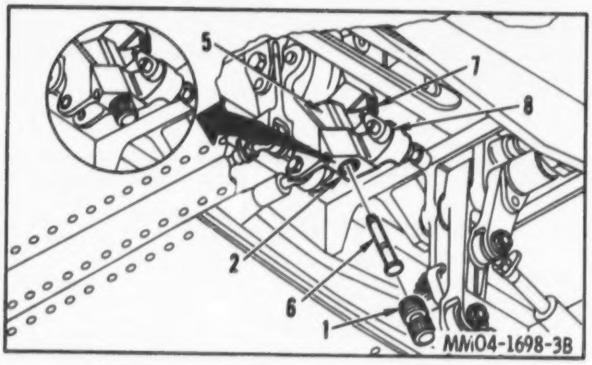
Apply petrolatum (E16) to tapered end of shear pin before installation.

1. **Install shear pin (6) in arm (2) and housing (5).**

   a. Aline arm (2) with housing (5).

   b. Ensure that switch detect (7) and switch position lever (8) are engaged.

   c. Insert shear pin (6) through arm (2) and housing (5).



NOTE

Install retainer fingertight.

2. **Install retainer (1) in arm (2).** Lockwire retainer (1) to arm. Use lockwire (E34).

3. **Inspect (TI).**

4. **Secure access cover B60** (para 2-2-2).

END OF TASK

11-3-24. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT 11-3-24

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-585-8434

Materials/Parts:

Cotter Pin (2)
Shear Pin
(E16) Petrolatum
(E34) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

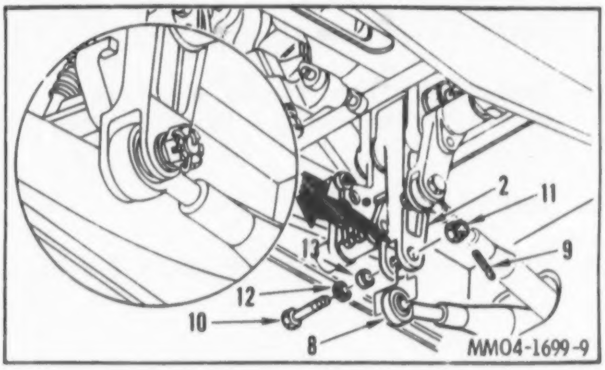
TM 55-1520-238-T

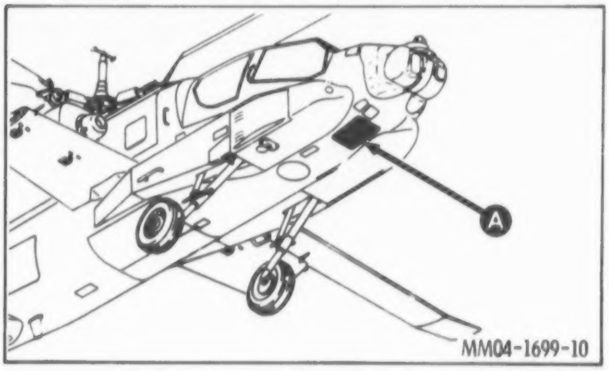
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access door B60 opened
11-3-2	CPG cyclic stick cover removed

A. REMOVAL

1. **Enter CPG Station (para 1-7-1). Observe all safety precautions.**





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11-3-24. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT (cont) 11-3-24

1. **Disconnect link (1) from arm (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5) and washer (6).

   c. Remove bolt (4), washer (6), and bushing (7).

2. **Disconnect lateral push-pull rod (8) from arm (2).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10), washer (12) and bushing (13).

3. **Remove shear pin retainer (14) from arm (2).**

   a. Remove lockwire.

   b. Unscrew retainer (14).

NOTE

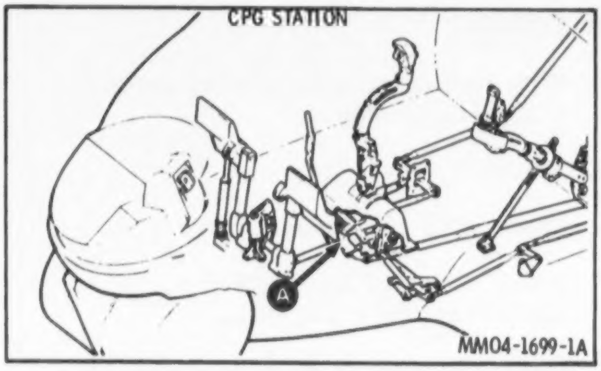
Remove shear pin in pieces if sheared.

4. **Remove shear pin half (15) from arm (2).**

5. **Remove shear pin half (16) from lever (17).**

   a. Aline arm (2) with lever (17).

   b. Remove shear pin half (16) through arm (2).


CPG STATION
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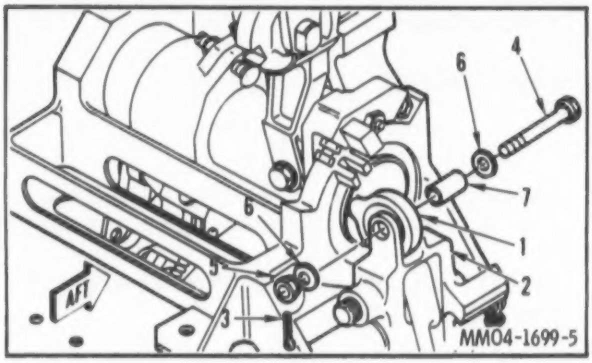
MM04-1699-1A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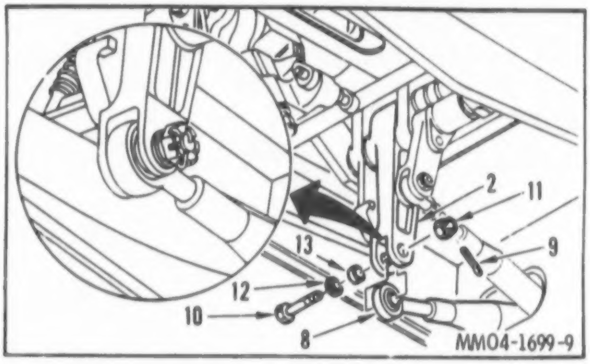
MM04-1699-5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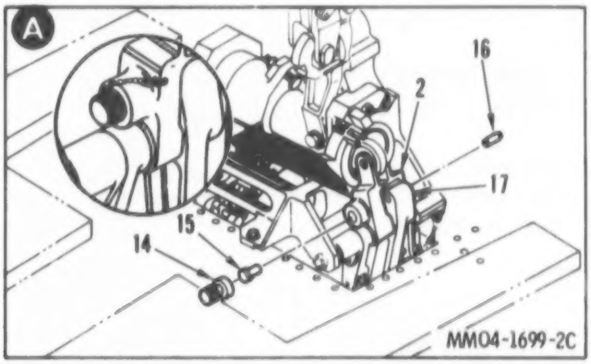
MM04-1699-9


A
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MM04-1699-2C

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11-3-24. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT (cont) 11-3-24

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

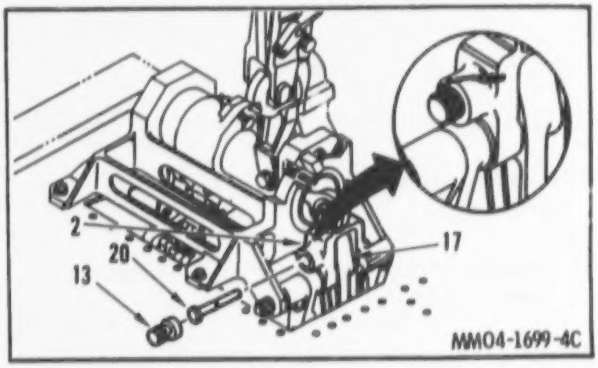
1. **Check SPAD for damage** (para 11-3-1).
2. **Check retainer and SPAD for corrosion** (para 1-5-38).
3. **Check retainer for damaged threads.** None allowed.

D. INSTALLATION

NOTE

Apply petrolatum (E16) to the tapered end of shear pin before installation.

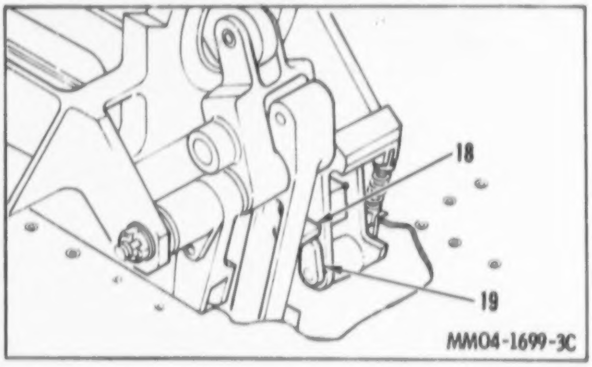
1. **Install new shear pin (20) in arm (2) and lever (17).**
   a. Aline arm (2) with lever (17).
   b. Ensure that switch detent (18) and switch position lever (19) are engaged.
   c. Insert shear pin (20) through arm (2) and lever (17).



NOTE

Install retainer fingertight.

2. **Install retainer (13) on arm (2).** Lockwire retainer (13) to arm (2). Use lockwire (E34).



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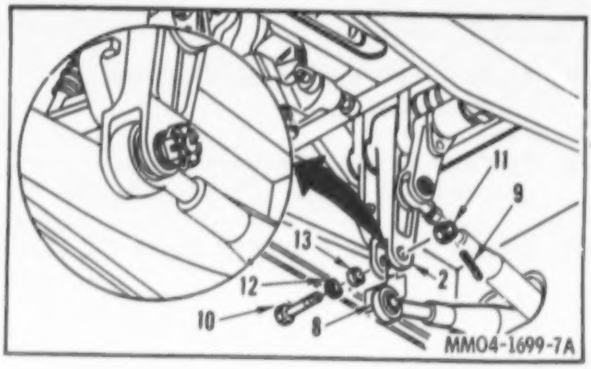
11-3-24. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT (cont) 11-3-24



3. Connect lateral push-pull rod (8) to arm (2).

a. Aline push-pull rod (8) with arm (2).

b. Install bushing (13) in lever (2).

c. Insert bolt (10) through washer (12), push-pull rod (8), bushing (13), and arm (2).

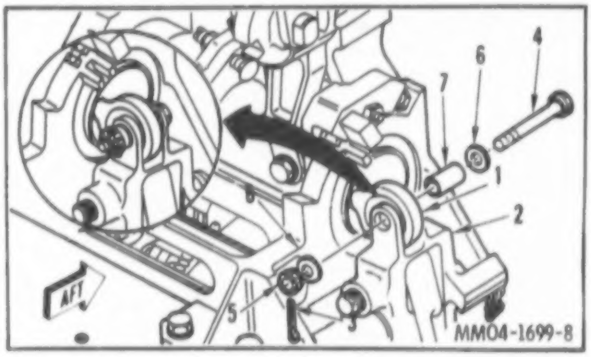
d. Hold bolt (10). Install nut (11).

4. Torque nut (11) 30 to 40 INCH-POUNDS.

a. Hold bolt (10). Torque nut (11) to **30 INCH-POUNDS.**

b. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

c. Install new cotter pin (9) in alined hole.



5. Connect link (1) to arm (2).

a. Install bushing (7) in arm (2).

b. Insert bolt (4) through washer (6) bushing (7) and arm (2), and link (1).

c. Hold bolt (4). Install washer (6) and nut (5).

6. Torque nut (5) 20 to 25 INCH-POUNDS.

a. Hold bolt (4). Torque nut (5) to **20 INCH-POUNDS.**

b. Increase torque to aline cotter pin holes, but do not exceed **25 INCH-POUNDS.**

c. Install new cotter pin (3) in alined hole.

GO TO NEXT PAGE

11-3-24. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT (cont) 11-3-24

7. Inspect (TI).

8. Install CPG cyclic stick cover (para 11-3-2).

9. Perform flight control system operational check (TM 55-1520-238-T).

10. Secure access door B60 (para 2-2-2).

END OF TASK

11-3-25. PILOT CYCLIC STICK REMOVAL 11-3-25

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-0-323-4692

Equipment Conditions:

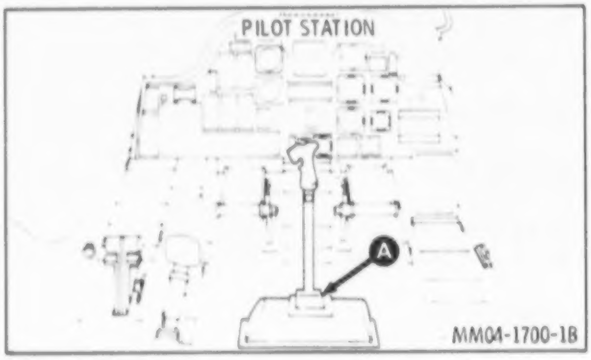
Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed

Personnel Required:

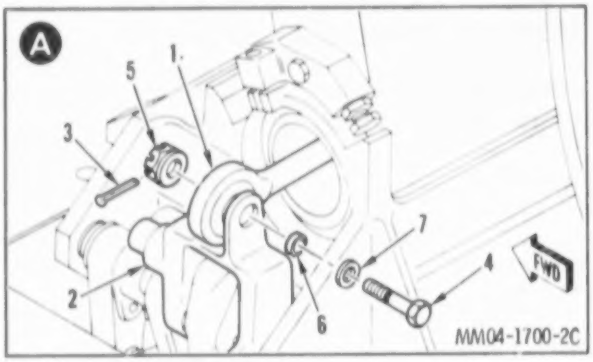
67R10 Attack Helicopter Repairer

A. **REMOVAL**

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**



2. **Disconnect link (1) from arm (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4) bushing (6), and washer (7).



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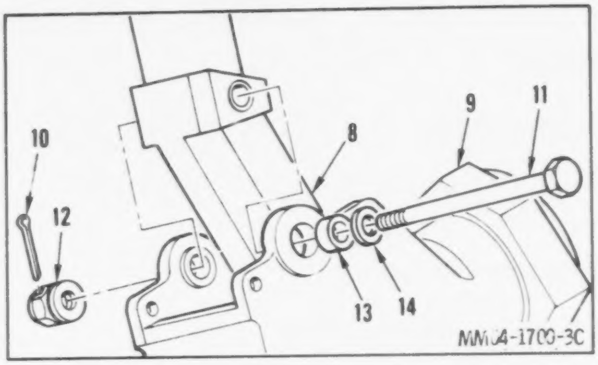
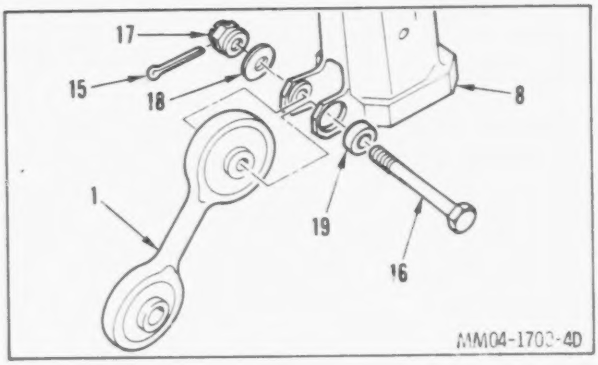
11-3-25. PILOT CYCLIC STICK REMOVAL (cont) 11-3-25





3. **Remove cyclic stick (8) from housing (9).**
   - a. Remove and discard cotter pin (10).
   - b. Hold bolt (11). Remove nut (12).
   - c. Remove bolt (11), washer (14) and bushing (13).
4. **Remove link (1) from cyclic stick (8).**
   - a. Remove and discard cotter pin (15).
   - b. Hold bolt (16). Remove nut (17) and washer (18).
   - c. Remove bolt (16) and bushing (19).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check cyclic stick, housing, and link for damage** (para 11-3-1).
2. **Check cyclic stick, housing, and link for corrosion** (para 1-5-38).

END OF TASK

11-3-26. PILOT CYCLIC STICK INSTALLATION 11-3-26

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (3)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Connect link (1) to cyclic stick (2).**

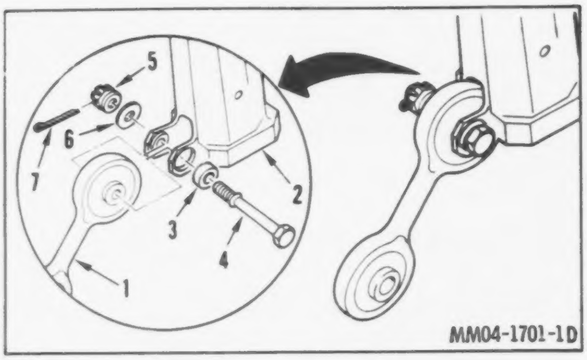
   a. Aline link (1) with stick (2).

   b. Install bushing (3) in stick (2).

   c. Insert bolt (4) through stick (2), bushing (3), and link (1).

   d. Hold bolt (4). Install washer (6) and nut (5).

   e. Install new cotter pin (7).



MM04-1701-1D

3. **Install cyclic stick (2) with link (1) in housing (8).**

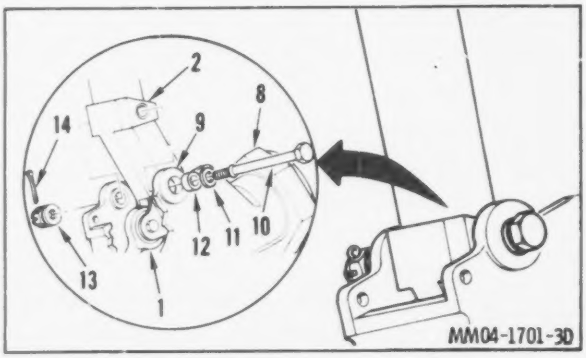
   a. Position stick (2) in housing (8) so that link (1) alines with arm (9).

   b. Insert bolt (10) through washer (11), bushing (12), housing (8), and stick (2).

   c. Hold bolt (10).

   d. Install nut (13).

   e. Install new cotter pin (14).



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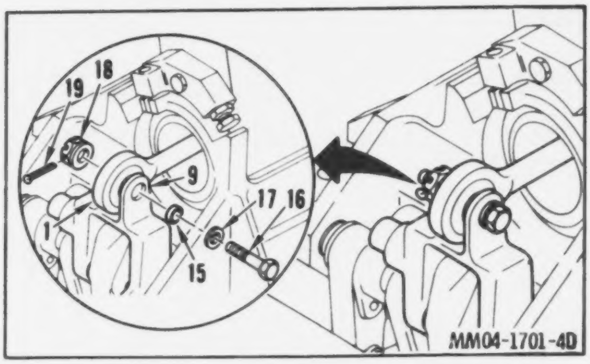
11-3-26. PILOT CYCLIC STICK INSTALLATION (cont) 11-3-26



4. **Install link (1) in arm (9).**
   a. Aline link (1) and arm (9).
   b. Install bushing (15) in arm (9).
   c. Insert bolt (16) through washer (17), bushing (15), arm (9), and link (1).
   d. Hold bolt (16).
   e. Install nut (18).
5. **Torque nut (18) 20 to 25 INCH-POUNDS.**
   a. Hold bolt (16). Torque nut (18) to **20 INCH-POUNDS.**
   b. Increase torque to aline cotter pin holes but do not exceed **25 INCH-POUNDS.**
   c. Install new cotter pin (19).
6. **Inspect (TI).**
7. **Install pilot cyclic stick cover** (para 11-3-28).
8. **Perform flight control system operational check** (TM 55-1520-238-T).

END OF TASK

11-3-27. PILOT CYCLIC STICK COVER REMOVAL 11-3-27

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

A. **REMOVAL**

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Remove forward and aft covers (1).**

   a. Hold two bolts (2).

   b. Remove two nuts (3) and two washers (4).

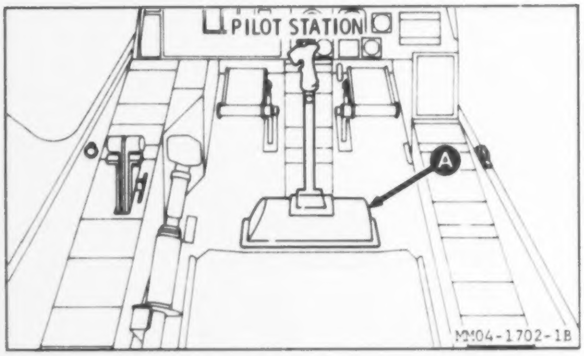
   c. Remove two bolts (2) and two washers (4) from two covers (1).

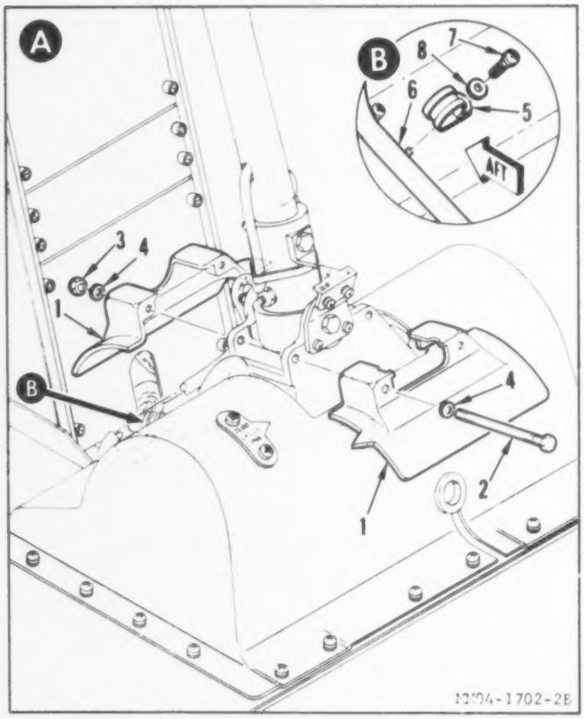
   d. Remove two covers (1).

3. **Remove clamp (5) from wire harness (6).**

   a. Remove screw (7) and washer (8) from clamp (5).

   b. Remove clamp (5) from wire harness (6).





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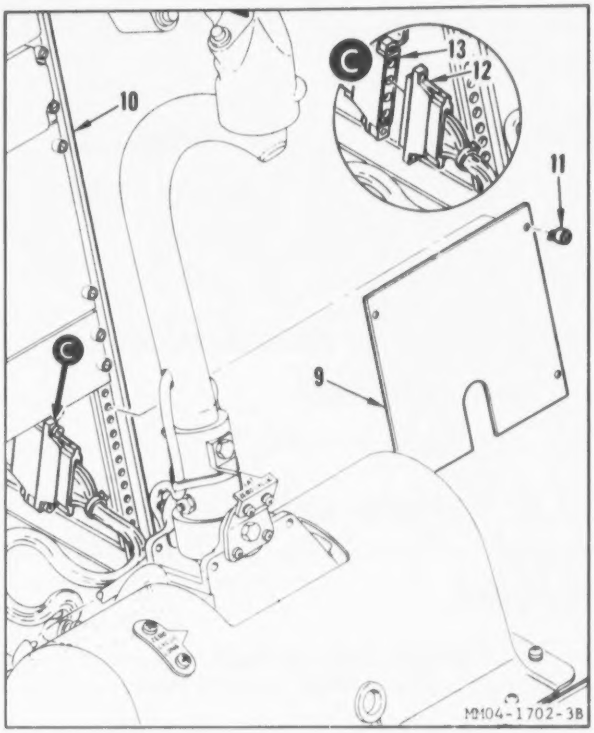
11-3-27. PILOT CYCLIC STICK COVER REMOVAL (cont) 11-3-27

4. **Remove lower plate (9) from center console (10).**

   a. Loosen four fasteners (11).

   b. Pull plate (9) from console (10).

5. **Detach connector J113 (12) from connector P113 (13).**



6. **Remove four screws (14) and four washers (15) from cover (16) and housing (17).**

7. **Remove 18 screws (18) and 18 washers (19) from cover (16) and floor (20).**

8. **Remove cover (16) from pilot cyclic stick (21).**

B. **CLEANING**

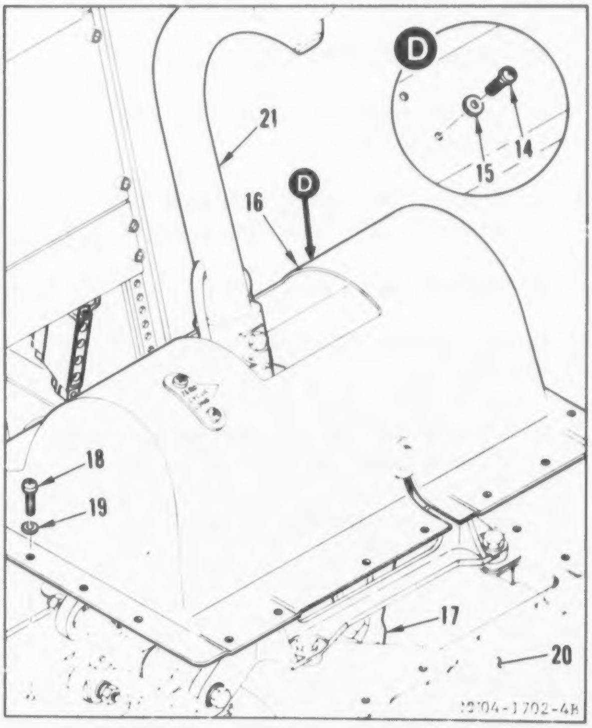
Clean all removed and attaching parts (para 1-5-36).

C. **INSPECTION**

1. **Check pilot cyclic stick components for damage** (para 11-3-1).

2. **Check pilot cyclic stick components for corrosion** (para 1-5-38).

END OF TASK



11-3-28. PILOT CYCLIC STICK COVER INSTALLATION 11-3-28

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

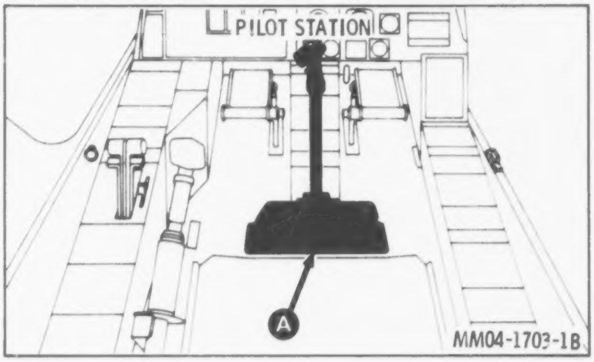
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Position cover (1) over pilot cyclic stick (2).**
3. **Install 18 washers (4) and 18 screws (3) attaching cover (1) to floor (5).**
4. **Install four washers (7) and four screws (6) attaching cover (1) to housing (8).**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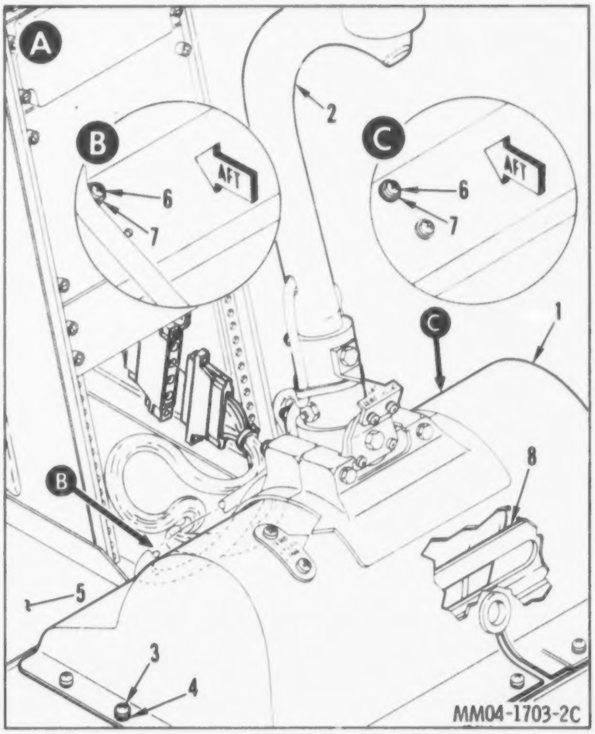
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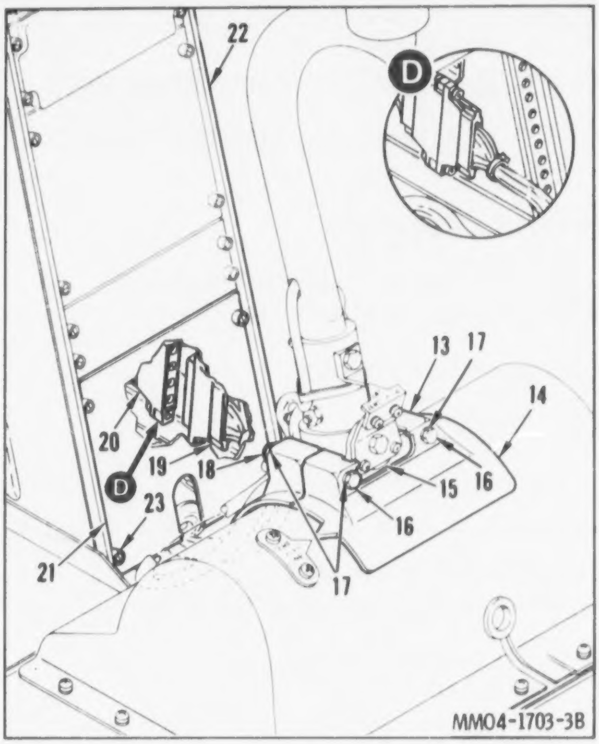
11-3-28. PILOT CYCLIC STICK COVER INSTALLATION (cont) 11-3-28

5. **Install clamp (9) on wire harness (10).**
    a. Position clamp (9) on wire harness (10).
    b. Install washer (12) and screw (11).

6. **Install forward cover (13) and aft cover (14) on housing (15).**
    a. Position forward cover (13) and aft cover (14) on housing (15).
    b. Install two bolts (16) through two washers (17), forward cover (13), housing (15), and aft cover (14).
    c. Install two washers (17) and two nuts (18) on two bolts (16).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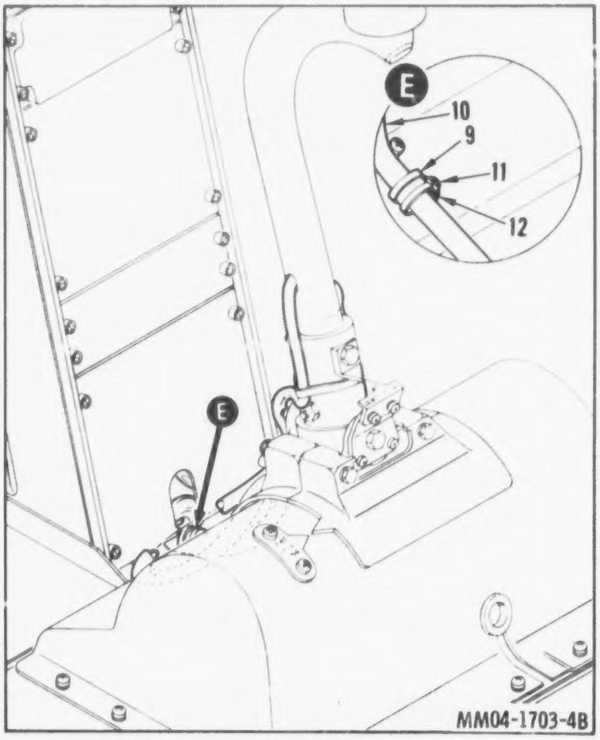
MM04-1703-3B

7. **Attach connector P113 (19) to connector J113 (20).**

8. **Inspect (TI).**

9. **Install lower plate (21) on center console (22).** Tighten four fasteners (23).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MM04-1703-4B

END OF TASK

11-3-29. PILOT CYCLIC STICK HOUSING REMOVAL 11-3-29

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

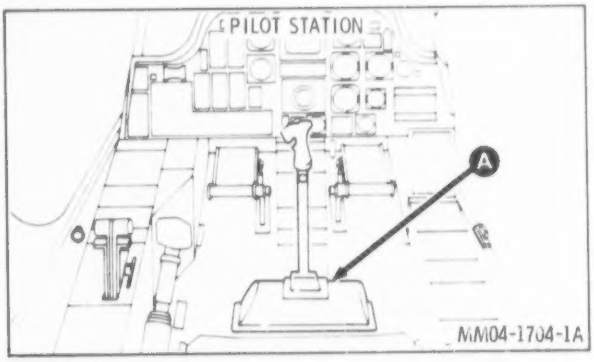
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

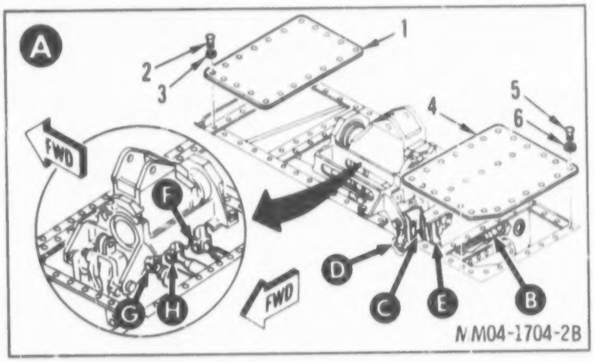
Personnel Required:

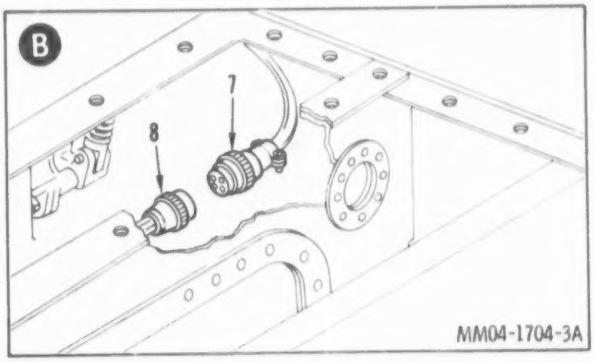
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
11-3-25	Pilot cyclic stick removed
13-2-17	Pilot lower right floor duct removed
TM 11-1520-238-23-1	HUD and holster removed
2-3-81	Pilot foot guard removed







A. **REMOVAL**

1. **Remove access cover (1).**
   a. Remove 18 screws (2) and 18 washers (3).
   b. Pull cover (1) from floor.
2. **Remove access cover (4).**
   a. Remove 33 screws (5) and 33 washers (6).
   b. Pull cover (4) from floor.
3. **Detach connector P231 (7) from connector J231 (8).**

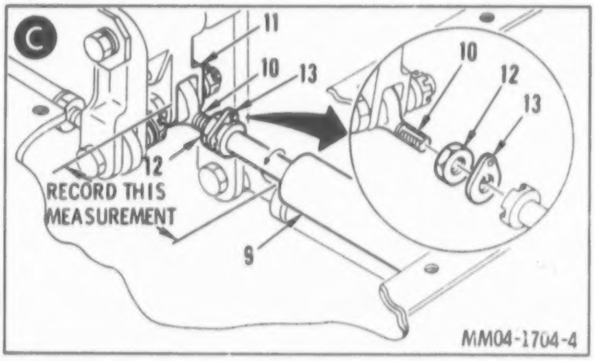
GO TO NEXT PAGE

11-3-29. PILOT CYCLIC STICK HOUSING REMOVAL (cont) 11-3-29

CAUTION

Shaft of LVDT may become disconnected from LVDT. If shaft is disconnected from LVDT, insert shaft in LVDT.

4. **Disconnect lateral transducer (9) from rod end (10).**
   a. Measure distance between end of transducer (9) and edge of arm (11). Record measurement for installation.
   b. Remove lockwire.
   c. Loosen jam nut (12).
   d. Rotate shaft of transducer (9) counterclockwise until free of rod end (10).
   e. Remove jam nut (12) and washer (13) from rod end (10).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RECORD THIS MEASUREMENT
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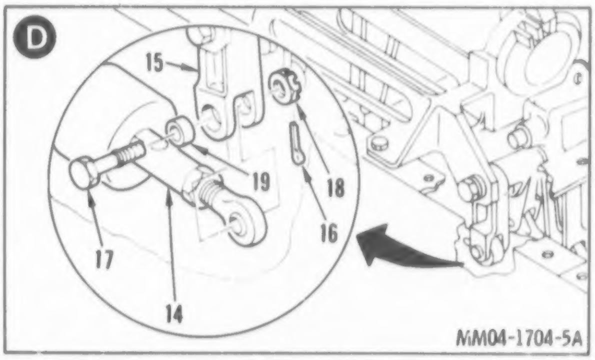
MM04-1704-4

5. **Disconnect lateral feel spring cartridge (14) from arm (15).**
   a. Remove and discard cotter pin (16).
   b. Hold bolt (17). Remove nut (18).
   c. Remove bolt (17) and bushing (19).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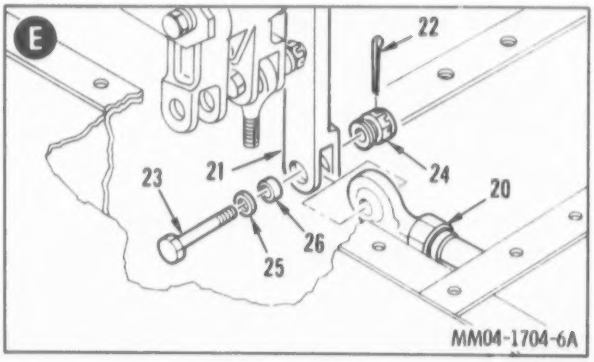
MM04-1704-5A

6. **Disconnect push-pull rod (20) from arm (21).**
   a. Remove and discard cotter pin (22).
   b. Hold bolt (23). Remove nut (24).
   c. Remove bolt (23), washer (25), and bushing (26).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MM04-1704-6A

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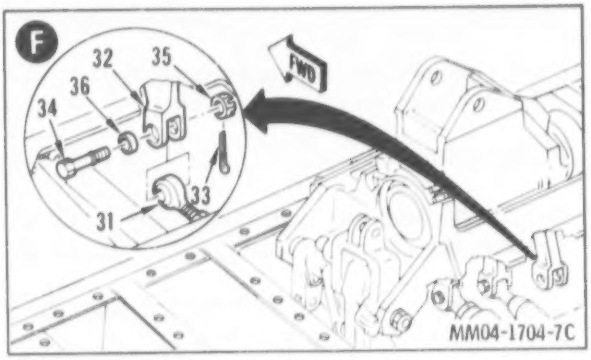
11-3-29. PILOT CYCLIC STICK HOUSING REMOVAL (cont)

7. **Disconnect longitudinal transducer (31) from arm (32).**

   a. Remove and discard cotter pin (33).

   b. Hold bolt (34). Remove nut (35).

   c. Remove bolt (34) and bushing (36).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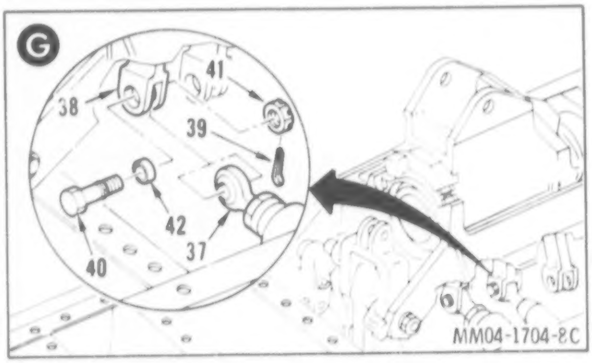
MM04-1704-7C

8. **Disconnect longitudinal feel spring cartridge (37) from arm (38).**

   a. Remove and discard cotter pin (39).

   b. Hold bolt (40). Remove nut (41).

   c. Remove bolt (40) and bushing (42).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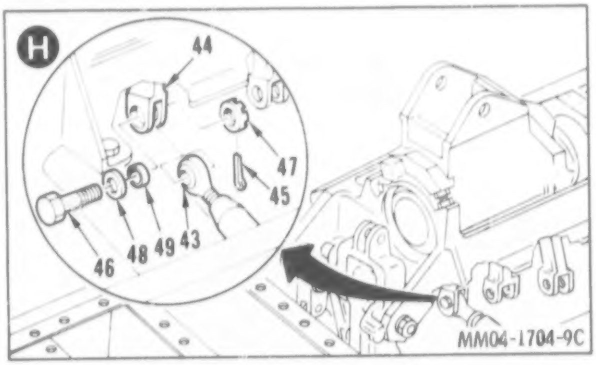
MM04-1704-8C

9. **Disconnect longitudinal push-pull rod (43) from arm (44).**

   a. Remove and discard cotter pin (45).

   b. Hold bolt (46). Remove nut (47).

   c. Remove bolt (46), washer (48), and bushing (49).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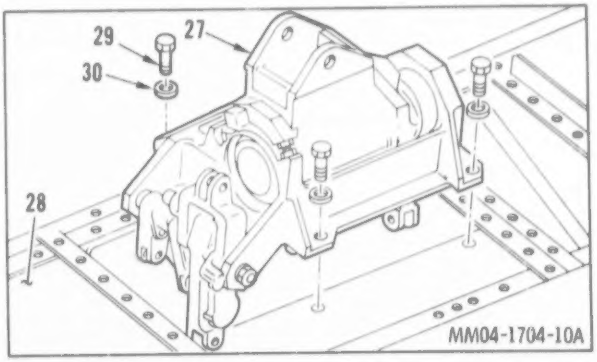
MM04-1704-9C

10. **Remove housing (27) from floor (28).**

    a. Remove four bolts (29) and four washers (30).

    b. Lift housing (27) from floor (28).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MM04-1704-10A

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11-3-29. PILOT CYCLIC STICK HOUSING REMOVAL (cont) 11-3-29

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check removed and attaching parts for damage (para 11-3-1).
2. Check removed and attaching parts for corrosion (para 1-5-38).

END OF TASK

11-3-30. PILOT CYCLIC STICK HOUSING INSTALLATION 11-3-30

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin (5)
(E29)	Lockwire

Personnel Required:

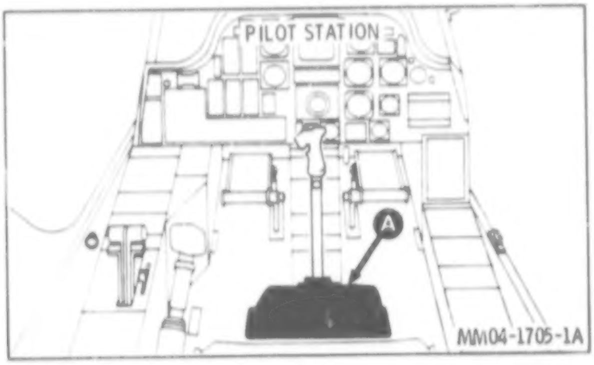
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 11-1520-238-23-1

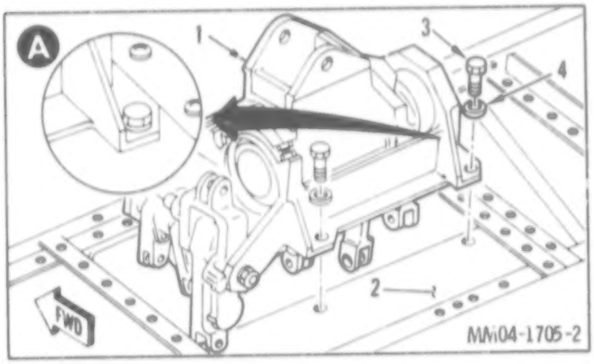
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



MM04-1705-1A

1. **Install housing (1) on floor (2).**
   a. Position housing (1) on floor (2). Aline mounting holes.
   b. Install four washers (4) and four bolts (3).



MM04-1705-2

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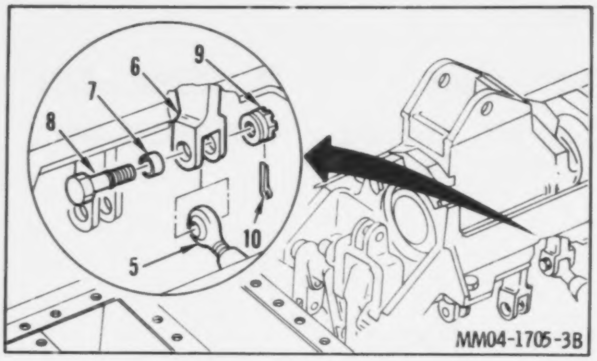
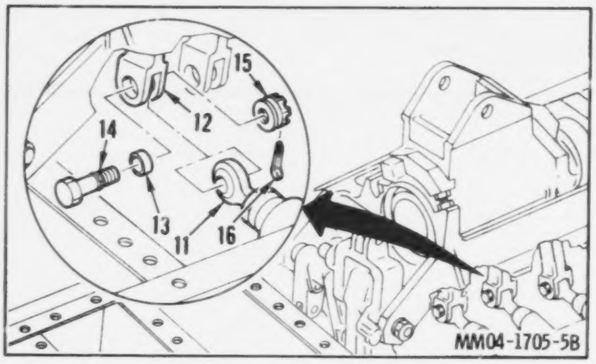
11-3-30. PILOT CYCLIC STICK HOUSING INSTALLATION (cont) 11-3-30

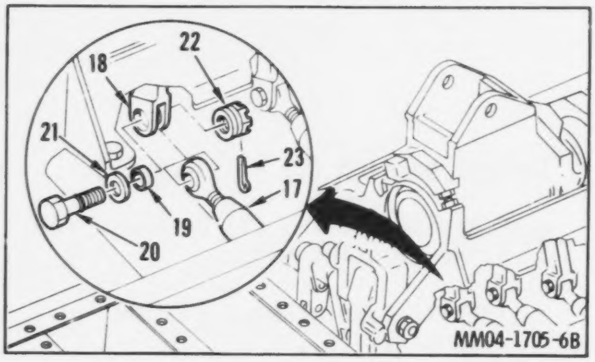
2. **Connect longitudinal transducer (5) to arm (6).**
   a. Aline transducer (5) with arm (6).
   b. Install bushing (7) in arm (6).
   c. Insert bolt (8) through transducer (5) and arm (6).
   d. Hold bolt (8). Install nut (9).
   e. Install new cotter pin (10).



3. **Connect longitudinal feel spring cartridge (11) to arm (12).**
   a. Aline cartridge (11) with arm (12).
   b. Install bushing (13) in arm (12).
   c. Insert bolt (14) through arm (12), bushing (13), and cartridge (11).
   d. Hold bolt (14). Install nut (15).
   e. Install new cotter pin (16).



4. **Connect longitudinal push-pull rod (17) to arm (18).**
   a. Aline rod (17) with arm (18).
   b. Install bushing (19) in arm (18).
   c. Insert bolt (20) through washer (21), rod (17), and arm (18).
   d. Hold bolt (20). Install nut (22).
   e. Install new cotter pin (23).



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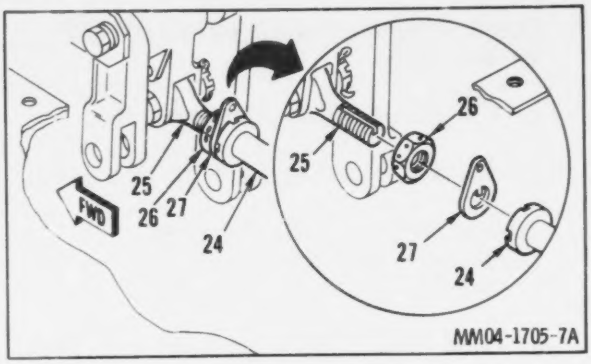
11-3-30. PILOT CYCLIC STICK HOUSING INSTALLATION (cont) 11-3-30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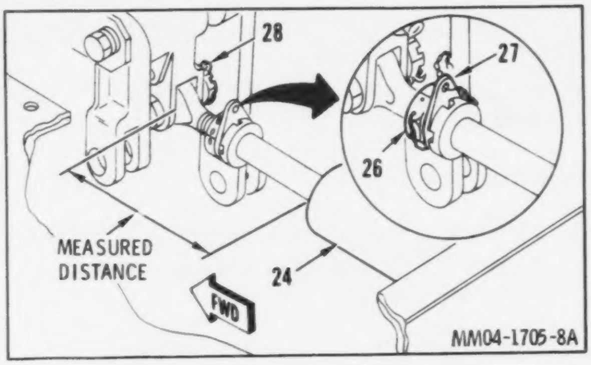
FWD
MM04-1705-7A

5. **Connect lateral transducer (24) to rod end (25).**

   a. Position nut (26) and washer (27) on rod end (25).

   b. Aline shaft of transducer (24) with rod end (25).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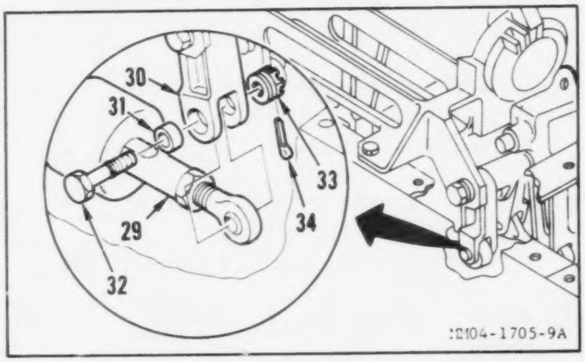
MM04-1705-8A

6. **Connect transducer (24) to arm (28).** Use measurement recorded during removal.

   a. Engage threads and rotate shaft of transducer (24) clockwise until required measurement has been obtained.

   b. Tighten nut (26).

   c. Lockwire nut (26) to lock washer (27). Use lockwire (E29).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MM04-1705-9A

7. **Connect lateral feel spring cartridge (29) to arm (30).**

   a. Aline cartridge (29) with arm (30).

   b. Install bushing (31) in arm (30).

   c. Insert bolt (32) through bushing (31), cartridge (29), and arm (30).

   d. Hold bolt (32). Install nut (33).

   e. Install new cotter pin (34).

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11-3-30. PILOT CYCLIC STICK HOUSING INSTALLATION (cont) 11-3-30

8. **Connect lateral push-pull rod (35) to arm (36).**

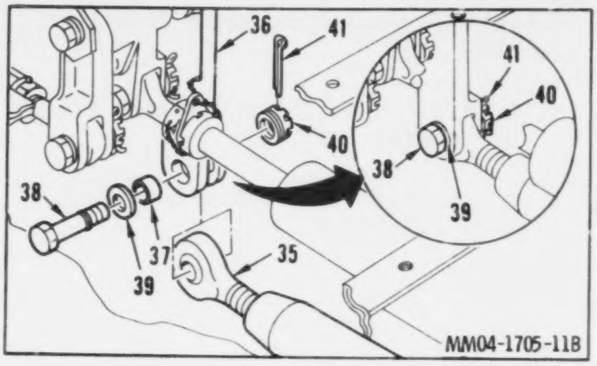
    a. Aline rod (35) with arm (36).

    b. Install bushing (37) in arm (36).

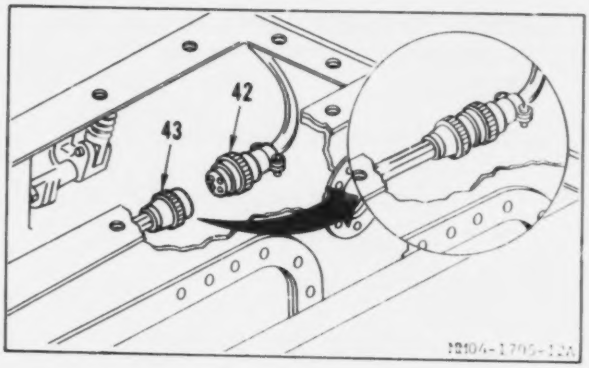
    c. Insert bolt (38) through washer (39), rod (35), and arm (36).

    d. Hold bolt (38). Install nut (40).

    e. Install new cotter pin (41).



9. **Attach connector P231 (42) to connector J231 (43).**



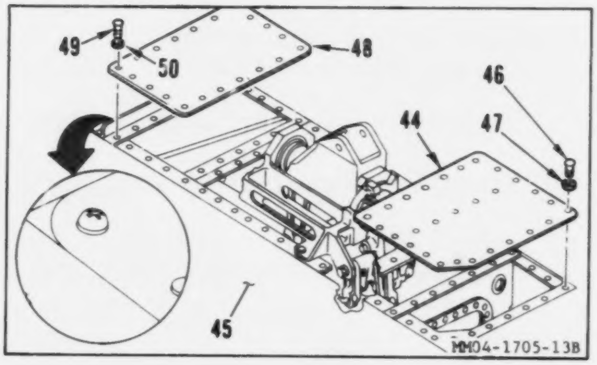
10. **Inspect (TI).**

11. **Perform longitudinal (cyclic) flight control rigging operational check** (TM 55-1520-238-T).

12. **Perform lateral (cyclic) flight control rigging operational check** (TM 55-1520-238-T).

13. **Install access cover (44) on floor (45). Install** 33 washers (47) and 33 screws (46).

14. **Install access cover (48) on floor (45). Install** 18 washers (50) and 18 screws (49).



15. **Install pilot cyclic stick** (para 11-3-26).

16. **Install pilot lower right floor duct** (para 13-2-17).

17. **Install pilot foot guard** (para 2-3-81).

18. **Install HUD and holster** (TM 11-1520-238-23-1).

END OF TASK

11-3-31. PILOT CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT 11-3-31

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Shear Pin Packing
(E16) Petrolatum
(E34) Lockwire

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover assembly removed

A. **REMOVAL**

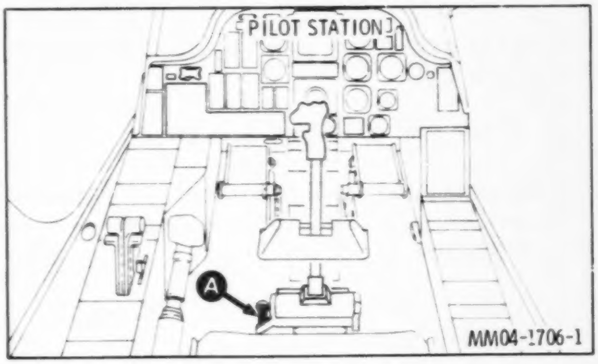
1. **Remove retainer (1) from arm (2).**

   a. Remove lockwire.

   b. Unscrew retainer (1).

NOTE

Remove shear pin in pieces if sheared.

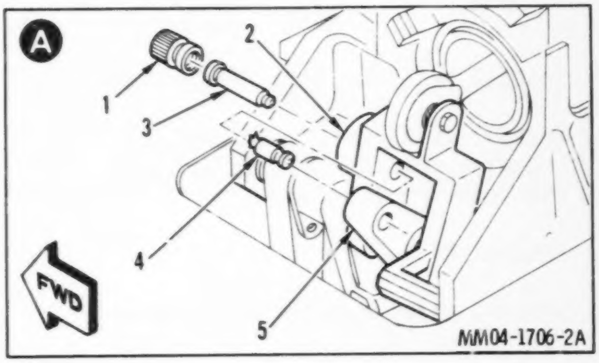


2. **Remove shear pin half (3) from arm (2).**

3. **Remove shear pin half (4) from arm (5).**

   a. Aline arm (2) with arm (5).

   b. Push shear pin half (4) through arm (2).



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11-3-31. PILOT CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT (cont) 11-3-31

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check retainer and SPAD for damage (para 11-3-1).
2. Check retainer and SPAD for corrosion (para 1-5-38).
3. Check retainer for damaged threads. None allowed.

D. INSTALLATION

NOTE

Apply petrolatum (E16) to the tapered end of shear pin before installation.

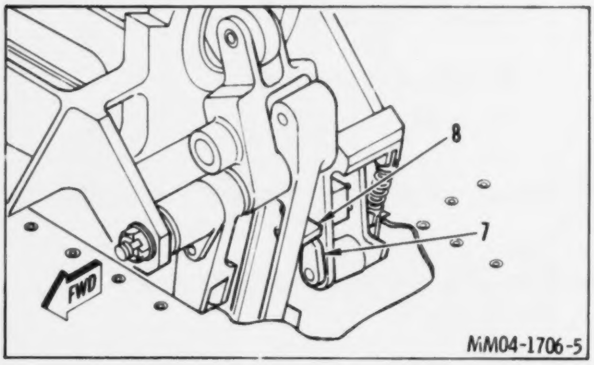
1. **Install new shear pin (6) in arm (2) and arm (5).**
   - a. Aline arm (2) with arm (5).
   - b. Ensure that switch detent (7) and switch position lever (8) are engaged.
   - c. Insert new shear pin (6) through arm (2) and arm (5).

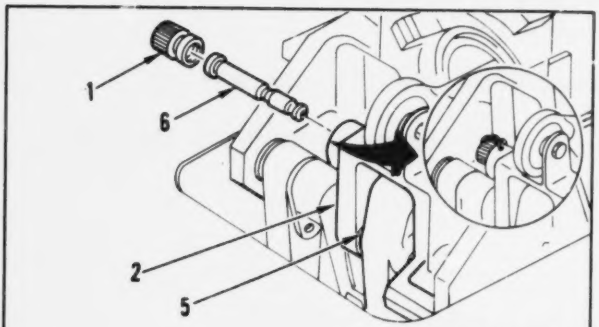
NOTE

Install retainer only fingertight.

2. **Install retainer (1) on arm (2).** Lockwire retainer (1) to arm (2). Use lockwire (E34).
3. **Inspect (TI).**
4. **Install pilot cyclic stick cover (para 11-3-28).**

END OF TASK





11-3-32. PILOT LATERAL POSITION TRANSDUCER REMOVAL 11-3-32

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
11-3-25	Pilot cyclic stick removed
11-3-29	Pilot cyclic stick housing removed
2-3-12	Pilot seat removed

A. REMOVAL

1. **Remove lateral position transducer (1) from bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

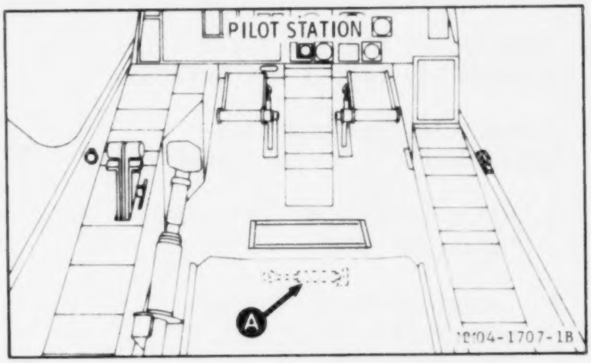
   c. Remove bolt (4) and washer (6).

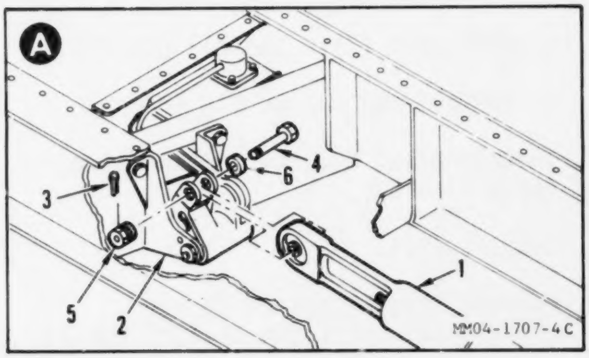
B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check position transducer and bellcrank for damage** (para 11-3-1).
2. **Check position transducer and bellcrank of corrosion** (para 1-5-38).





END OF TASK

11-3-33. PILOT LATERAL POSITION TRANSDUCER INSTALLATION 11-3-33

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

References:

TM 55-1520-238-T

Materials/Parts:

Cotter Pin

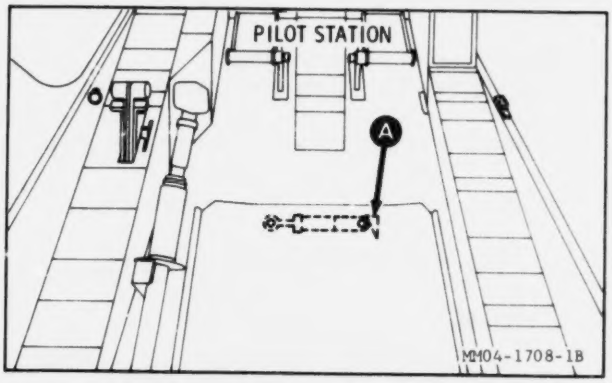
Personnel Required:

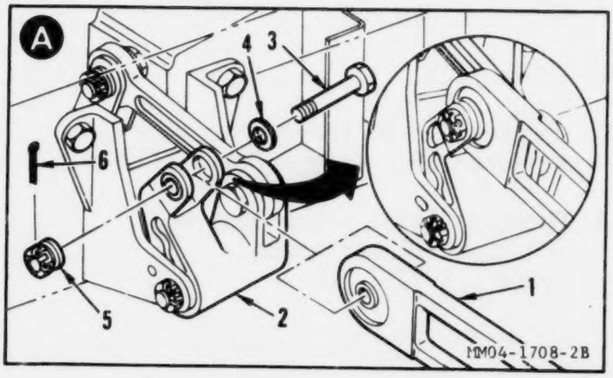
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**
2. **Connect lateral position transducer (1) to bellcrank (2).**
   a. Aline transducer (1) with bellcrank (2).
   b. Insert bolt (3) through washer (4), bellcrank (2), and transducer (1).
   c. Hold bolt (3). Install nut (5).
   d. Install new cotter pin (6).
3. **Install pilot cyclic stick housing** (para 11-3-30).
4. **Inspect (TI).**
5. **Perform flight control system operational check** (TM 55-1520-238-T).
6. **Install pilot seat** (para 2-3-12).
7. **Install pilot cyclic stick** (para 11-3-25).
8. **Install pilot cyclic stick cover** (para 11-3-27).





END OF TASK

11-3-34. PILOT LONGITUDINAL POSITION TRANSDUCER REMOVAL 11-3-34

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
11-3-25	Pilot cyclic stick removed
11-3-29	Pilot cyclic stick housing removed
2-3-12	Pilot seat removed

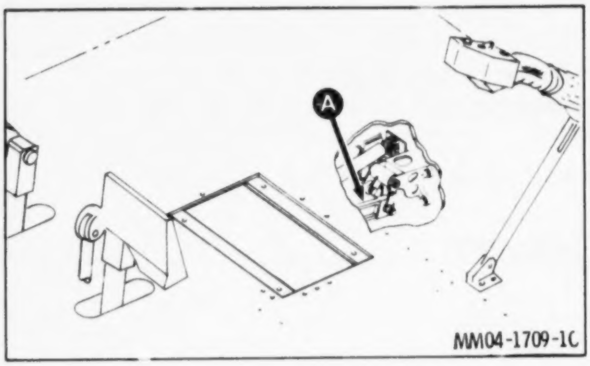
A. REMOVAL

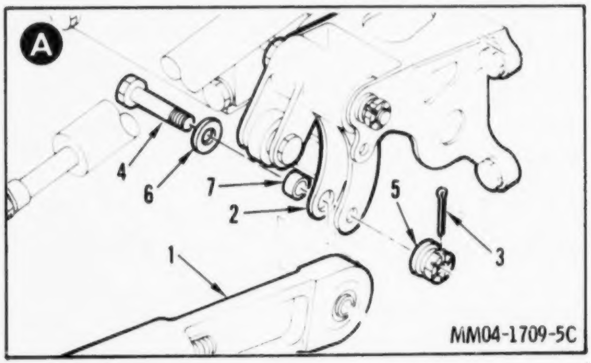
1. **Remove longitudinal position transducer (1) from bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), and bushing (7).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check transducer and bellcrank for damage** (para 11-3-1).

2. **Check transducer and bellcrank for corrosion** (para 1-5-38).

END OF TASK

11-3-35. PILOT LONGITUDINAL POSITION TRANSDUCER INSTALLATION 11-3-35

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

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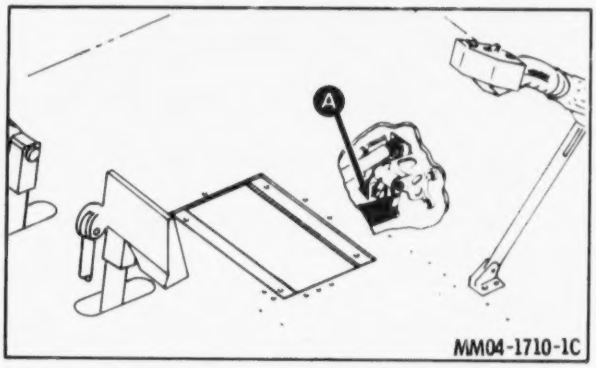
1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**



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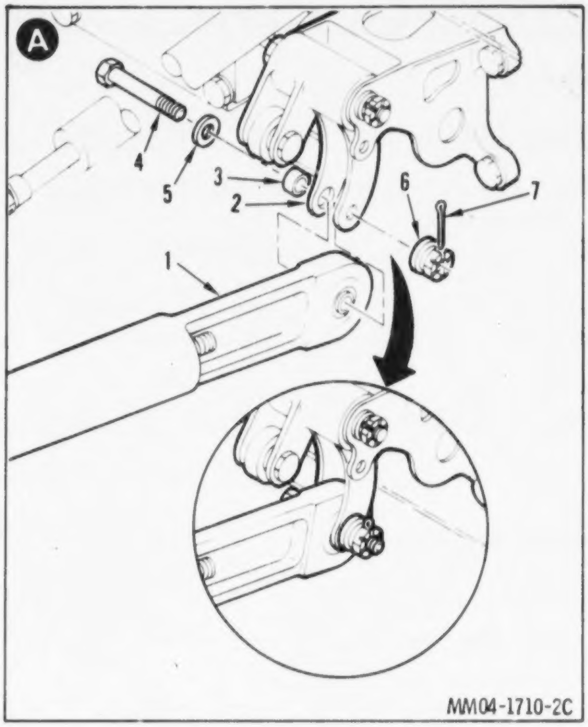
11-3-35. PILOT LONGITUDINAL POSITION TRANSDUCER INSTALLATION (cont) 11-3-35



2. **Connect longitudinal position transducer (1) to bellcrank (2).**

   a. Aline transducer (1) with bellcrank (2).

   b. Install bushing (3) in bellcrank (2).

   c. Insert bolt (4) through washer (5), bushing (3), transducer (1), and bellcrank (2).

   d. Hold bolt (4). Install nut (6).

   e. Install new cotter pin (7).

3. **Install pilot cyclic stick housing assembly** (para 11-3-30).

4. **Inspect (TI).**

5. **Perform flight control system operational check** (TM 55-1520-238-T).

6. **Install pilot seat** (para 2-3-12).

7. **Install pilot cyclic stick** (para 11-3-25).

8. **Install pilot cyclic stick cover** (para 11-3-27).

END OF TASK

11-3-36. SWASHPLATE REMOVAL 11-3-36

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Sling, Universal	1730-01-193-9857
Wrench, 1-1/16 and 1-1/4 Open-end	5120-00-187-7134
Crane, Maintenance	1730-01-183-3106

Materials/Parts:

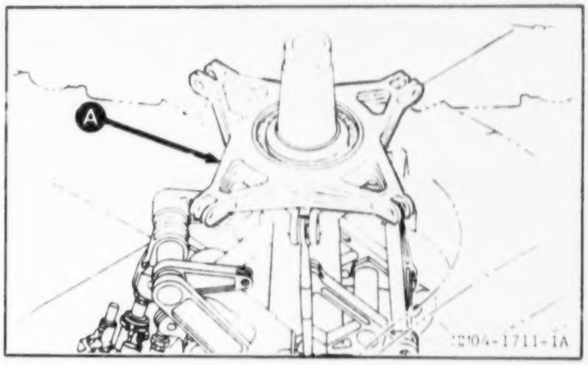
(E24) Lockwire

Personnel Required:

67R10 Attack Helicopter Repairer (2)
One to assist

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 opened
1-7-42	Maintenance crane installed
5-2-11	Main rotor head removed
11-3-44	Secondary main rotor scissor removed
11-3-43	Load bearing main rotor scissor removed
11-3-48	Main rotor pitch links removed



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11-3-36. SWASHPLATE ASSEMBLY REMOVAL (cont) 11-3-36

A. REMOVAL

1. **Attach universal sling (1) on swashplate (2).**

   a. Install one strap through each arm of swashplate (2).

   b. Hook and adjust straps to same length.

2. **Connect crane hook (3) to universal sling (1).** Raise crane hook (3) to remove slack from sling (1).

CAUTION

Lateral links and torque link may be be damaged if allowed to fall. Do not let them be scratched or bent.

3. **Disconnect torque link (4) from swashplate (2).**

   a. Remove and discard cotter pin (5).

   b. Hold bolt (6). Remove nut (7). Use 1-1/16 open-end wrench and 1-1/16 socket.

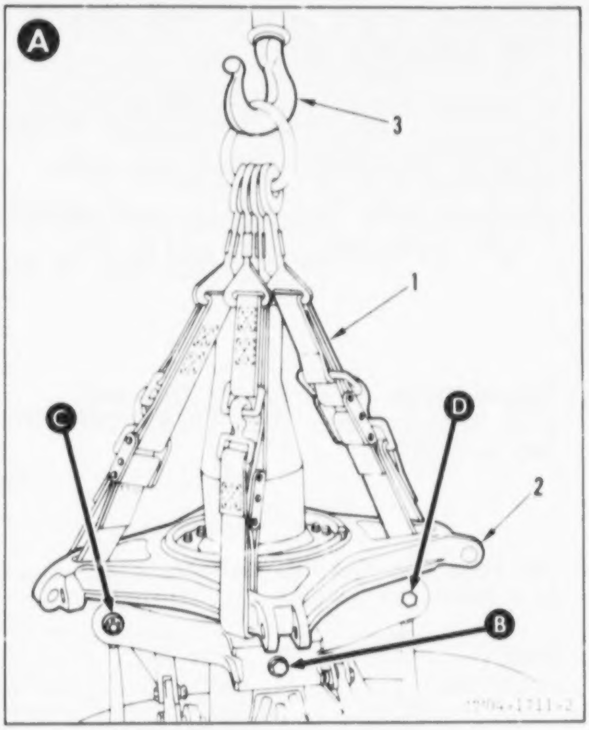
   c. Remove bolt (6), washer(s) (8) (if installed), and bushing (9).

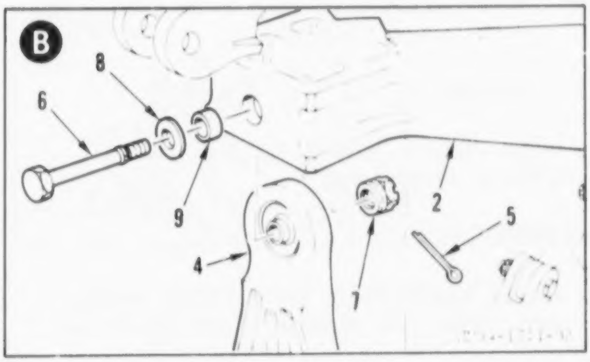
4. **Disconnect left lateral link (10) from swashplate (2).**

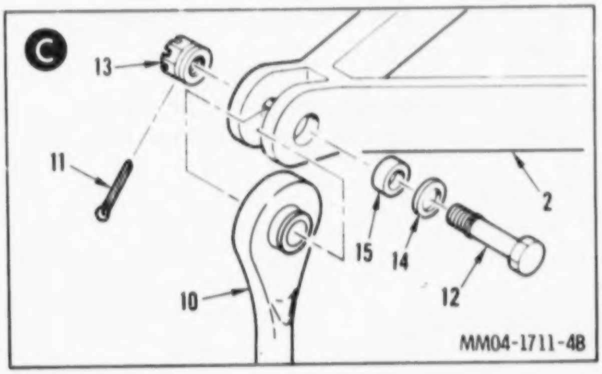
   a. Remove and discard cotter pin (11).

   b. Hold bolt (12). Remove nut (13).

   c. Remove bolt (12), washer(s) (14) (if installed), and bushing (15).







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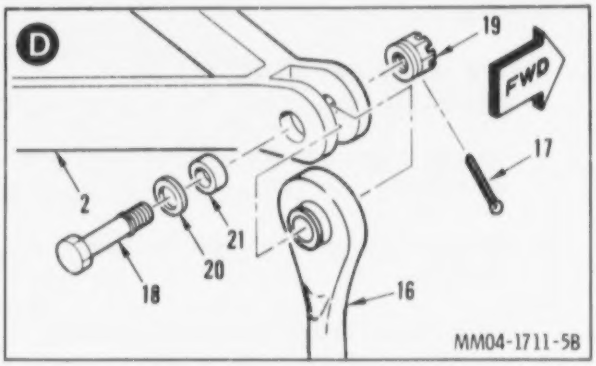
5. **Disconnect right lateral link (16) from swashplate (2).**

   a. Remove and discard cotter pin (17).

   b. Hold bolt (18). Remove nut (19).

   c. Remove bolt (18), washer(s) (20) (if installed), and bushing (21).



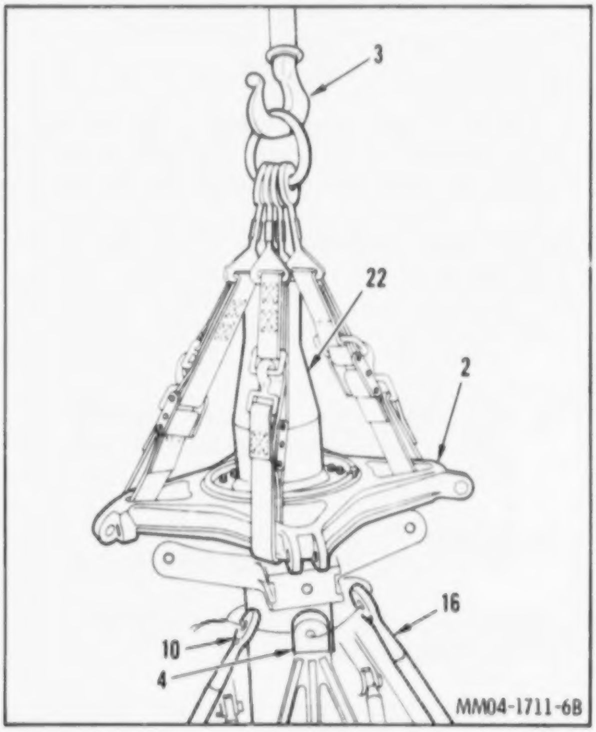
6. **Secure three links (4), (10), and (16) to main rotor mast (22).** Use lockwire (E24).

CAUTION

One repairer must guide swashplate to prevent damage to mast threads.

7. **Remove swashplate (2) from main rotor mast (22).**

   Lift swashplate (2) from mast (22). Use crane hook (3).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check swashplate, main rotor mast, and links for damage** (para 11-3-1).

2. **Check swashplate assembly radial and axial play and freedom of movement** (para 11-3-1).

3. **Check swashplate, main rotor mast, and links for corrosion** (para 1-5-38).

END OF TASK

11-3-37. SWASHPLATE INSTALLATION 11-3-37

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, Torque, 1/2 Drive	5120-00-270-3121
Sling, Universal	1730-01-193-9857
Wrench, 1-1/16 and 1-1/4 Open-end	5120-00-187-7134
Crane, Maintenance	1730-01-183-3106

Materials/Parts:

Cotter Pin (3)

Personnel Required:

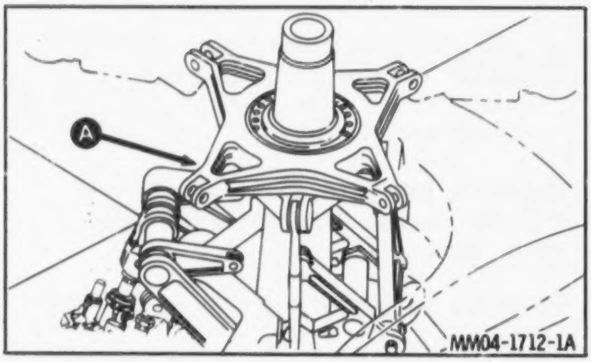
67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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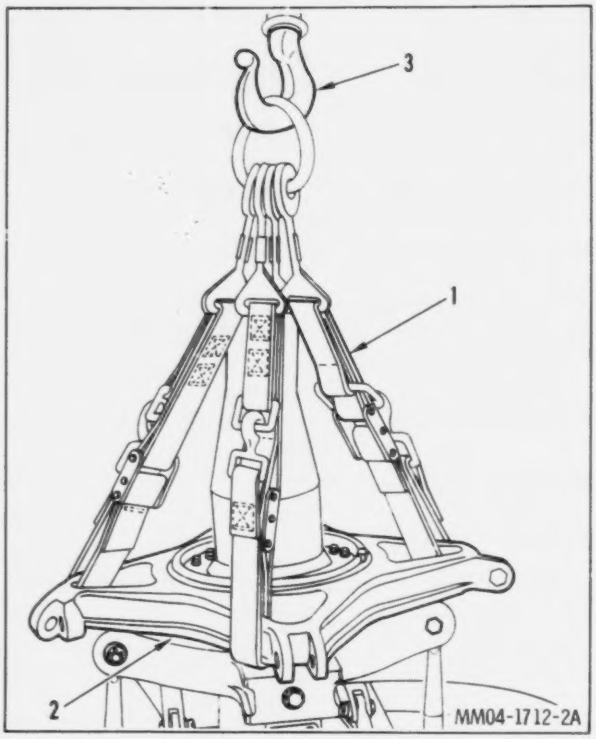
11-3-37. SWASHPLATE INSTALLATION (cont) 11-3-37

1. **Attach universal sling (1) to swashplate (2).**

   a. Install one strap through each arm of swashplate (2).

   b. Hook and adjust straps to same length.

   c. Connect crane hook (3) to sling (1).



CAUTION

- The entire weight of the swashplate must be supported by the crane until both lateral links and the torque link are connected. One repairer must guide the swashplate as it is lowered on the mast to prevent damage to the mast threads.
- Lateral links and torque link may be damaged if allowed to fall. Do not let them be scratched or bent.

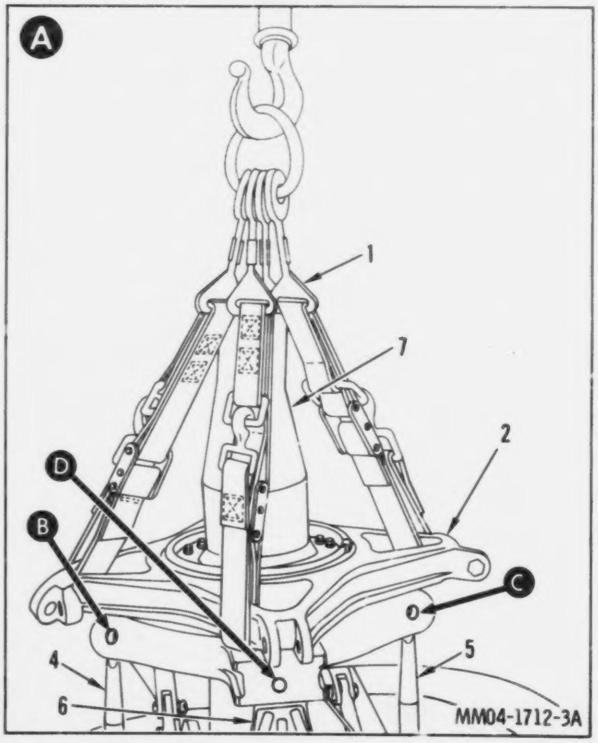
2. **Unsecure two lateral links (4) and (5) and torque link (6) from main rotor mast (7).**

3. **Position swashplate (2) on mast (7).**

   a. Lift and position swashplate (2) above mast (7).

   b. Guide and aline swashplate (2) into position for links (4), (5), and (6) connections.

   c. Lower swashplate (2) onto mast (7).



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NOTE

End of link with minimum **Dimension A** shall be connected to swashplate. If both ends have same **Dimension A**, either end may be connected to swashplate.

4. **Connect left lateral link (4) to swashplate (2).**

   a. Aline link (4) with swashplate (2).

   b. Install bushing (8) in swashplate (2).

NOTE

A maximum of two washers (22) are allowed under bolt head (if required) to ensure bushing (8) clamp-up and pin hole alinement.

   c. Insert bolt (9) through washers (22), bushing (8), swashplate (2), and link (4).

   d. Hold bolt (9). Install nut (10).

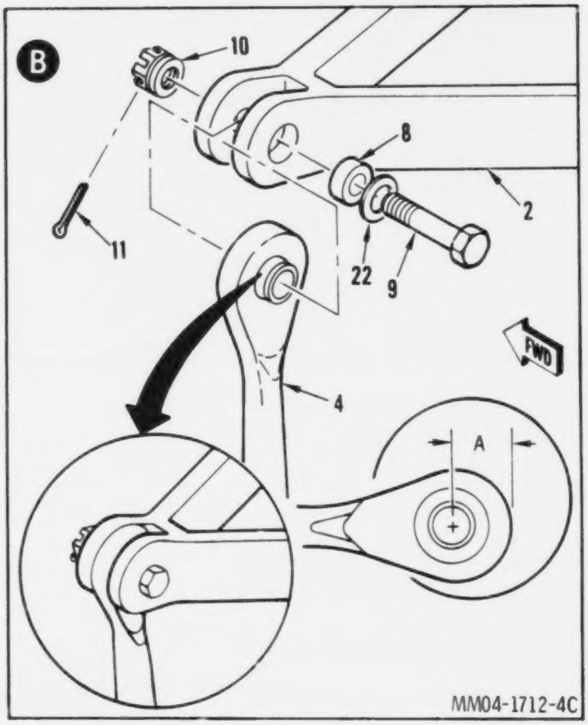
5. **Torque nut (10) 900 to 1100 INCH-POUNDS.**

   a. Hold bolt (9).

   b. Torque nut (10) to **900 INCH-POUNDS.**

   c. Aline cotter pin hole by increasing torque, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (11).



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11-3-37. SWASHPLATE INSTALLATION (cont) 11-3-37

6. **Connect right lateral link (5) to swashplate (2).**

   a. Aline link (5) with swashplate (2).

   b. Install bushing (12) in swashplate (2).

   NOTE

   A maximum of two washers (20) is allowed under bolt head (if required) to ensure bearing clamp-up and pin hole alinement.

   c. Insert bolt (13) through washers (20), bushing (12), swashplate (2), and link (5).

   d. Hold bolt (13). Install nut (14).

7. **Torque nut (14) 900 to 1100 INCH-POUNDS.**

   a. Hold bolt (13).

   b. Torque nut (14) to **900 INCH-POUNDS.**

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (15).

8. **Connect torque link (6) to swashplate (2).**

   a. Aline link (6) and swashplate (2).

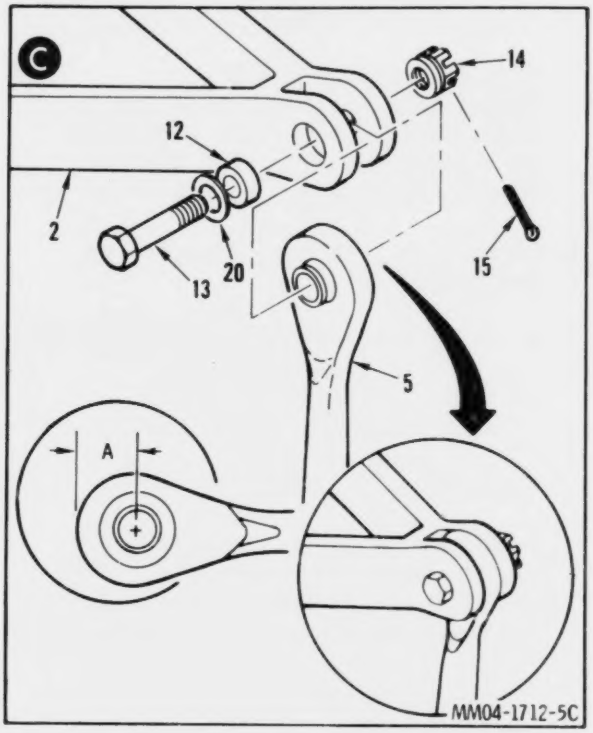
   b. Install bushing (16) in swashplate (2).

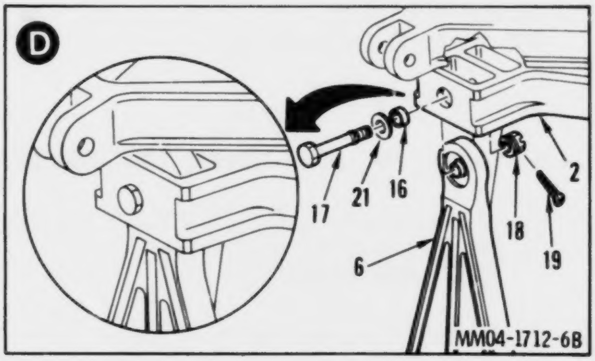
   NOTE

   A maximum of two washers (21) is allowed under bolt head (if required) to ensure bushing clamp-up and pin hole alinement.

   c. Insert bolt (17) through washers (21), bushing (16), swashplate (2), and link (6).

   d. Hold bolt (17). Install nut (18).





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11-3-37. SWASHPLATE INSTALLATION (cont) 11-3-37

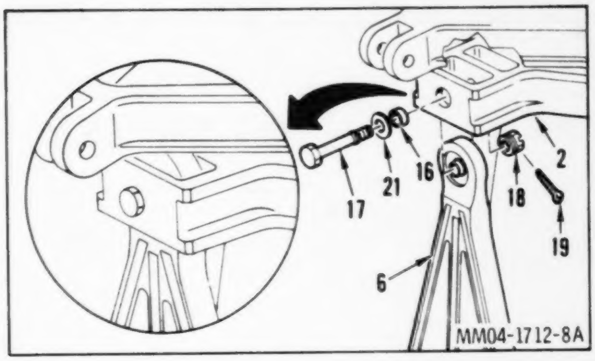
9. **Torque bolt (17) 900 to 1100 INCH-POUNDS.**

   a. Hold nut (18). Use 1-1/16 inch open-end wrench.

   b. Torque bolt (17) to **900 INCH-POUNDS.** Use 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (19).



10. **Release tension on sling (1).** Lower crane hook (3) to slacken sling (1).

11. **Disconnect crane hook (3) from sling (1)**

12. **Remove sling (1) from swashplate (2).**

13. **Remove lockwire that holds three links (4), (10), and (16) to mast (22).**

14. **Install main rotor pitch links** (para 11-3-48).

15. **Install main rotor scissor** (para 11-3-43).

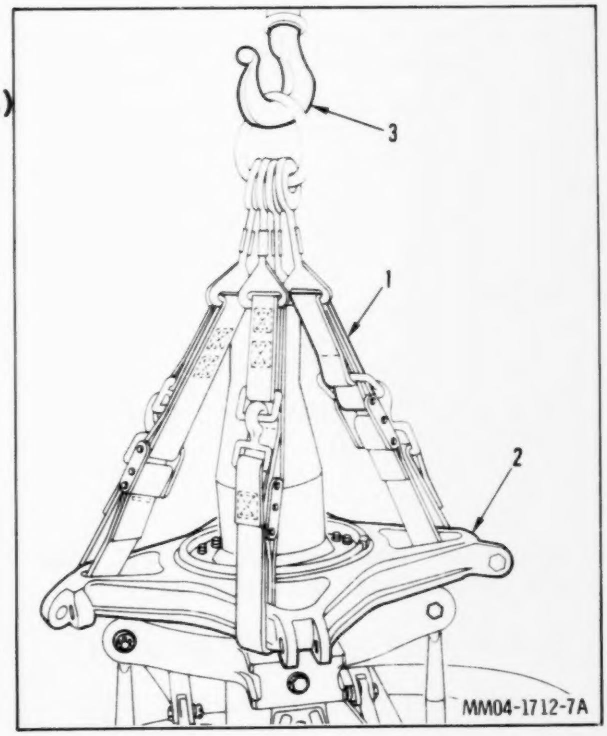
16. **Install secondary main rotor scissor** (para 11-3-44).

17. **Install main rotor head** (para 5-2-12).

18 **Inspect (TI).**

19. **Secure doors T250L, T250R, T290L, T290R, and L325** (para 2-2-2).

20. **Perform flight control system operational check** (TM 55-1520-238-T).



END OF TASK

11-3-38. LONGITUDINAL LINKS REMOVAL/INSTALLATION 11-3-38

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 3/8 Drive	5120-00-288-8865

Materials/Parts:

Cotter Pin (2)

Personnel Required:

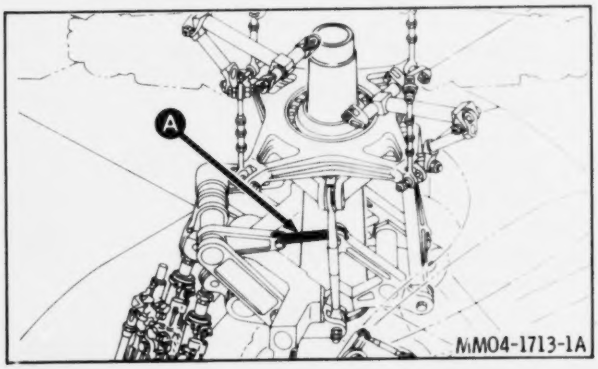
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Fairings T205L and T205R removed

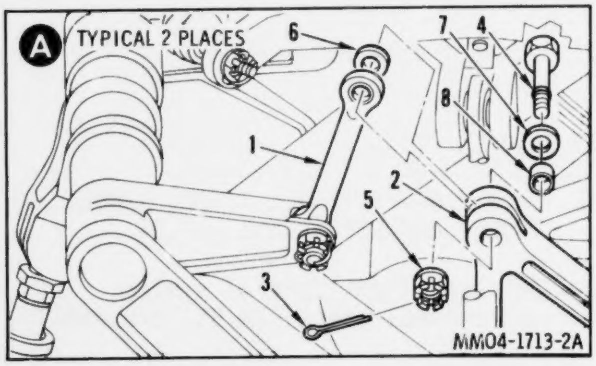


A. REMOVAL

NOTE

This task is typical for either longitudinal link.

1. **Disconnect longitudinal link (1) from aft longitudinal bellcrank (2).**
    - a. Remove and discard cotter pin (3).
    - b. Hold bolt (4). Remove nut (5).
    - c. Remove bolt (4), nylon washer (6), washer(s) (7) (if installed), and bushing (8).



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2. Disconnect longitudinal link (1) from forward longitudinal bellcrank (9).

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11). Remove nut (12).

   c. Remove bolt (11), bushing (13), and washers (14) (if installed).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check link and bellcrank for damage (para 11-3-1).

2. Check link and bellcrank for corrosion (para 1-5-38).

D. INSTALLATION

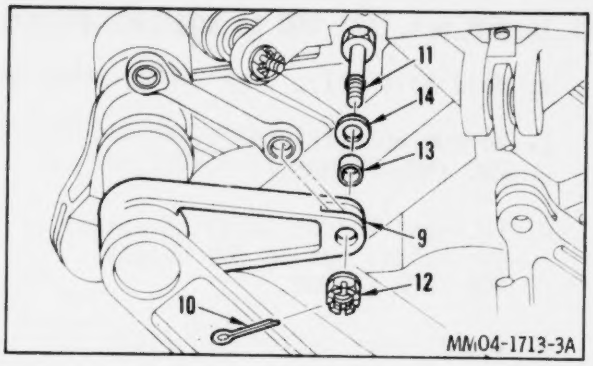
1. Connect longitudinal link (1) to forward longitudinal bellcrank (9).

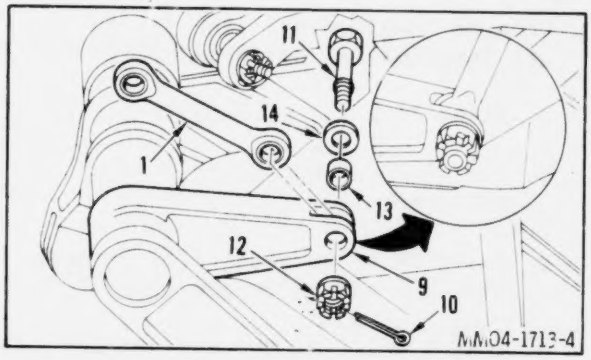
   a. Aline link (1) with bellcrank (9).

   b. Install bushing (13) in bellcrank (9).

   c. Insert bolt (11) through washers (14) (if required), bushing (13), bellcrank (9), and link (1).

   d. Hold bolt (11). Install nut (12).





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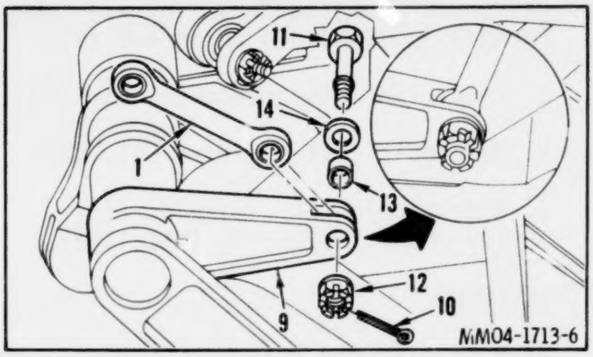
11-3-38. LONGITUDINAL LINKS REMOVAL/INSTALLATION (cont) 11-3-38



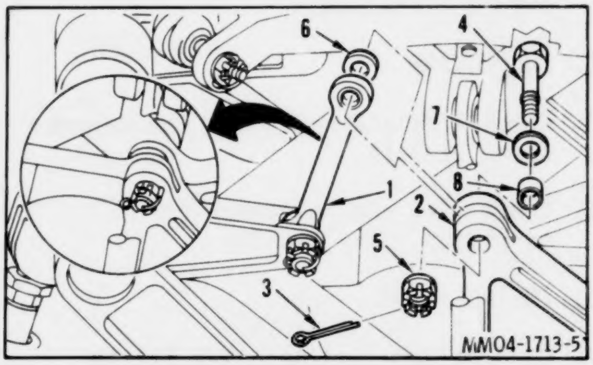
2. Torque nut (12) 280 to 400 INCH-POUNDS.

a. Hold bolt (11).

b. Torque nut (12) to **280 INCH-POUNDS.**

c. Increase torque to aline cotter pin holes, but do not exceed **400 INCH-POUNDS.**

d. Install new cotter pin (10).



3. Connect longitudinal link (1) to aft longitudinal bellcrank (2).

a. Aline link (1) with bellcrank (2).

b. Install bushing (8) in bellcrank (2).

c. Position nylon washer (6) between link (1) and bellcrank (2).

d. Insert bolt (4) through washers (7) (if required), bushing (8), bellcrank (2), and link (1).

e. Hold bolt (4). Install nut (5).

4. Torque nut (5) 280 to 400 INCH-POUNDS.

a. Hold bolt (4).

b. Torque nut (5) to **280 INCH-POUNDS.**

c. Increase torque to aline cotter pin holes, but do not exceed **400 INCH-POUNDS.**

d. Install new cotter pin (3).

5. Inspect (TI).

6. Secure fairings T250L and T205R (para 2-2-2).

7. Perform flight control system operational check (TM 55-1520-238-T).

END OF TASK

11-3-39. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL 11-3-39

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-11/16 & 1-7/8 Open-end (2)	5120-00-081-8100
Strap, Cargo (2)	1670-00-725-1437
Crowfoot 1-13/16, 1/2 Drive	5120-00-181-6752
Handle, Socket Wrench, 1/2 Drive	5120-00-221-7958
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134

Personnel Required:

67R10 Attack Helicopter Repairer (2)
One to assist

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors L200, L325, R200, T250L, T250R, T290L, and T290R opened
11-3-38	Longitudinal links removed

A. REMOVAL

1. **Install two cargo straps (1) around swashplate (2) and main rotor hub (3).**

2. **Tighten cargo straps (1) evenly until weight of swashplate (2) is supported by main rotor hub (3).**

NOTE

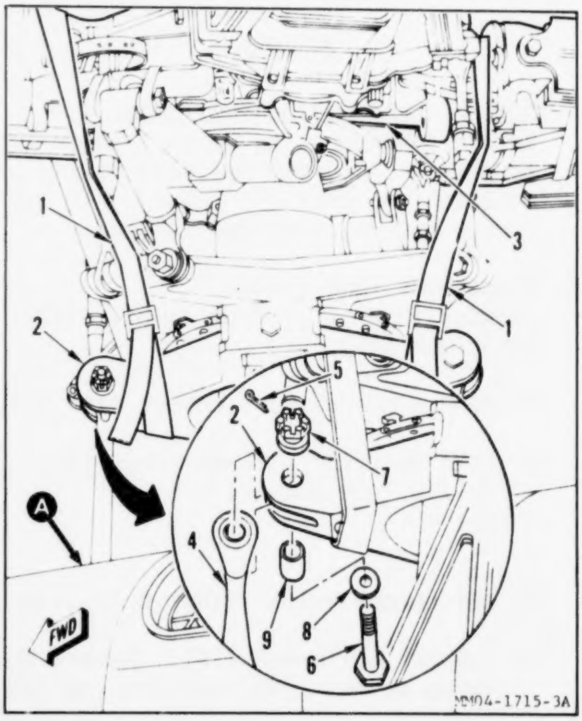
This task is typical for either lateral link.

3. **Disconnect lateral link (4) from swashplate (2).**

   a. Remove and discard cotter pin (5).

   b. Hold bolt (6). Remove nut (7). Use 1-1/16 inch open-end wrench and 1-1/16 inch socket.

   c. Remove bolt (6), washers (8) (if installed), and bushing (9).



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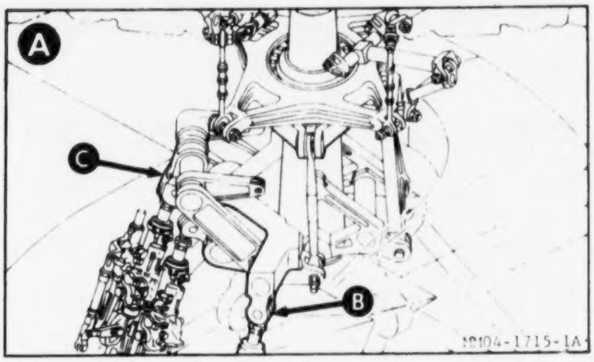
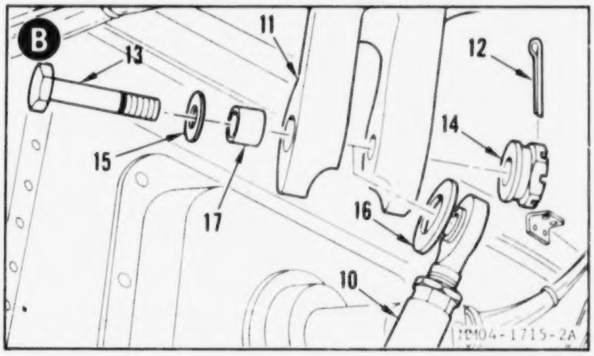
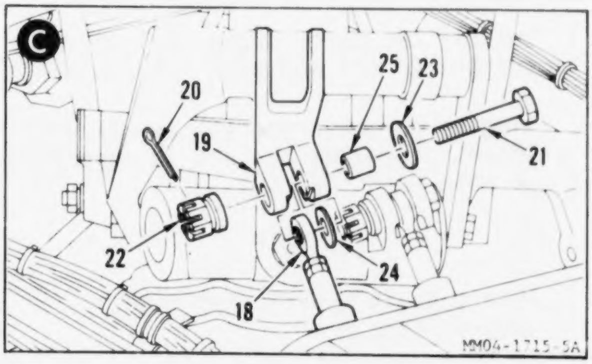
11-3-39. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL (cont) 11-3-39







CAUTION

To prevent damage to rigid hydraulic tubes, ensure upper end of servocylinder is supported when rod end is disconnected from the longitudinal bellcrank.

4. **Disconnect lateral servocylinder (10) from lateral bellcrank (11).**

   a. Remove and discard cotter pin (12).

   b. Hold bolt (13). Remove nut (14). Use 1-1/16 inch open-end wrench and 1-1/16 inch socket.

NOTE

Do not remove nylon washer unless it is loose or excessively worn.

   c. Remove bolt (13), washers (15) (if installed), nylon washer (16), and bushing (17).

WARNING

Support longitudinal bellcrank before disconnecting servocylinder to prevent longitudinal bellcrank movement and possible injury. If injury occurs, seek medical aid.

5. **Disconnect longitudinal servocylinder (18) from longitudinal bellcrank (19).**

   a. Remove and discard cotter pin (20).

   b. Hold bolt (21). Remove nut (22). Use 1-1/16 inch open-end wrench and 1-1/16 inch socket.

NOTE

Do not remove nylon washer unless it is loose or excessively worn.

   c. Support bellcrank (19). Remove bolt (21), washers (23) (if installed), nylon washer (24), and bushing (25).

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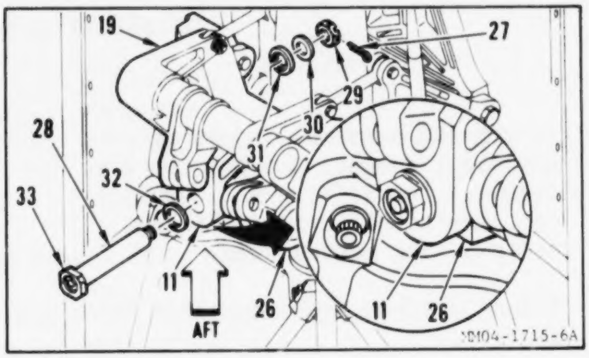
11-3-39. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL (cont) 11-3-39



6. **Disconnect lateral bellcrank (11) from collective bellcrank (26).**

   a. Remove and discard cotter pin (27).

   b. Raise longitudinal bellcrank (19).

   c. Hold bolt (28). Use 1-7/8 inch open-end wrench.

   d. Remove nut (29), washer (30), and nylon washer (31). Use 1-13/16 inch crowfoot.

   CAUTION

   To prevent damage to bushings, press retention device lock fully when removing bolt.

   e. Remove bolt (28) and nylon washer (32) by pressing button (33).

   f. Lower longitudinal bellcrank (19) as far as it will go.

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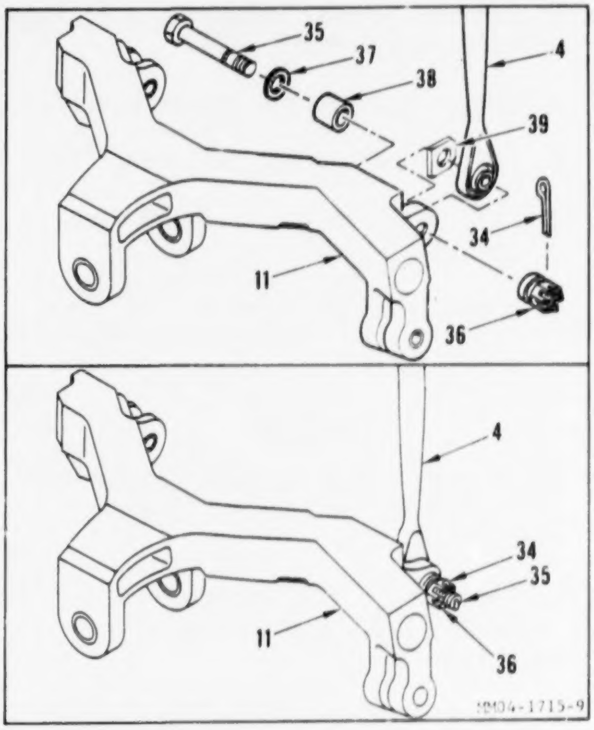


WARNING

To prevent personal injury or equipment damage, two persons are required for lifting and removing the lateral bellcrank. If injury occurs, seek medical aid.

7. **Remove lateral bellcrank (11) from helicopter.**

NOTE

This task is typical for either lateral link.

8. **Remove lateral links (4) from lateral bellcrank (11).**

   a. Remove and discard cotter pin (34).

   b. Hold bolt (35). Remove nut (36). Use 1-1/16 inch open-end wrench and 1-1/16 inch socket.

   c. Remove bolt (35), washers (37) (if installed), bushing (38), and limiter (39).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check lateral bellcrank and links installation and components for damage** (para 11-3-1).

2. **Check lateral bellcrank and links for corrosion** (para 1-5-38).

END OF TASK

11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION 11-3-40

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Crowfoot Attachment 1-13/16, 1/2 Drive	5120-00-181-6764
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-11/16 & 1-7/8 Open-end	5120-00-081-8100
Wrench, Torque, 3/8 Drive	5120-00-821-3441
Wrench, Torque, 1/2 Drive	5120-00-270-3121
Wrench,1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134

Materials/Parts:

	Cotter Pin (7)
(E23)	Adhesive
(E31)	Cheesecloth
(E39)	Trichloroethane
(E74)	Abrasive cloth

Personnel Required:

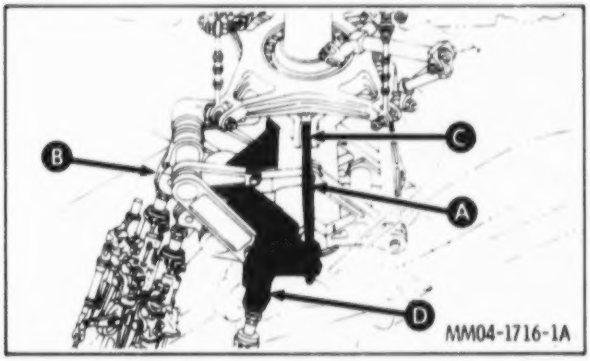
67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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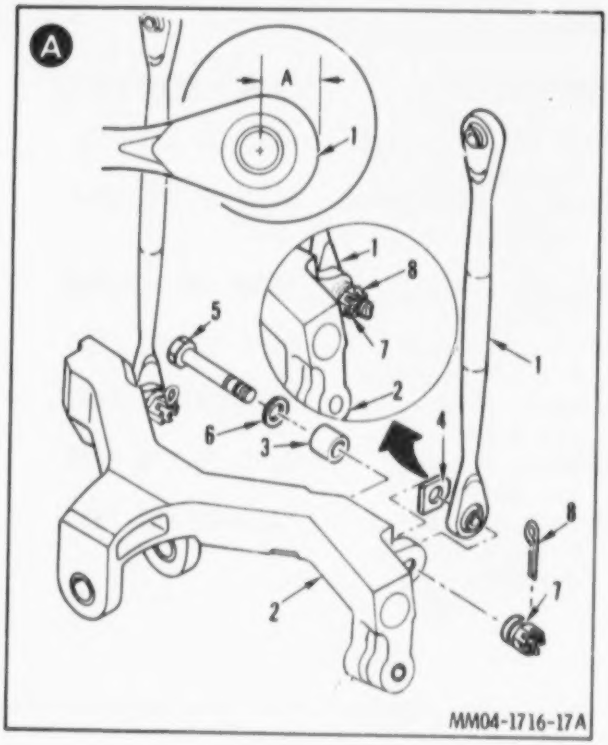
11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40



MM04-1716-17A

NOTE

- This task it typical for either lateral link.
- End of link with minimum **Dimension A** shall be connected to swashplate. If both ends have same **Dimension A**, either end may be connected to swashplate.

1. **Connect lateral link (1) to lateral bellcrank (2).**
   a. Aline link (1) with bellcrank (2).
   b. Install bushing (3) and limiter (4) in bellcrank (2).
   c. Insert bolt (5) through washers (6) (if required), bushing (3), limiter (4), link (1), and bellcrank (2).
   d. Hold bolt (5). Install nut (7).

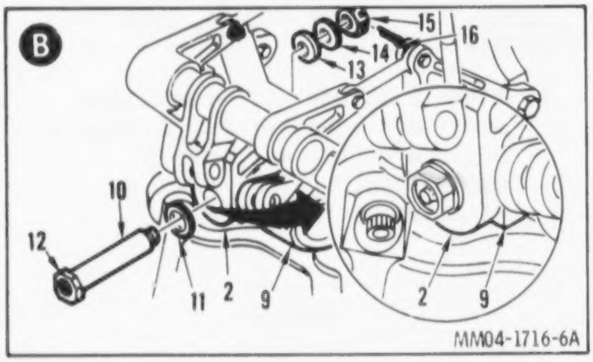
2. **Torque nut (7)**
   900 to 1100 INCH-POUNDS.
   a. Hold bolt (5). Use 1-1/16 inch open-end wrench.
   b. Torque nut (7) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.
   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**
   d. Install new cotter pin (8).

GO TO NEXT PAGE

11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40

WARNING

To prevent personnel injury or equipment damage, two persons are required for lifting and positioning the lateral bellcrank. If injury occurs, seek medical aid.



3. **Connect lateral bellcrank (2) to collective bellcrank (9).**

   a. Aline bellcrank (2) with bellcrank (9).

   CAUTION

   To prevent damage to bushings, press retention device lock fully when installing bolt.

   b. Insert bolt (10) with nylon washer (11) through bellcranks (2) and (9) while pressing button (12).

   c. Hold bolt (10).

   d. Install nylon washer (13), washer (14), and nut (15).

4. **Torque nut (15) 300 to 400 INCH-POUNDS.**

   a. Hold bolt (10). Use 1-7/8 inch open-end wrench

   b. Torque nut (15) to **300 INCH-POUNDS.** Use 1-13/16 inch crowfoot and 1/2 drive torque wrench.

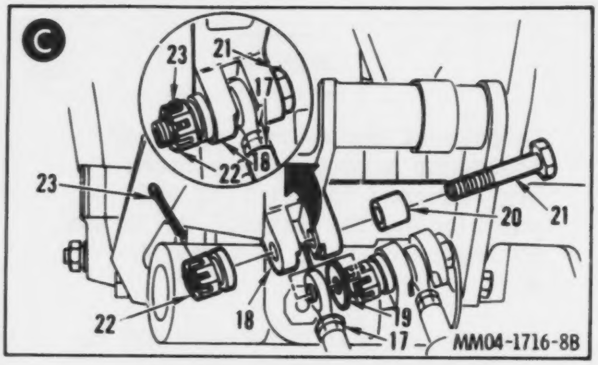
   c. Increase torque to aline cotter pin holes, but do not exceed **400 INCH-POUNDS.**

   d. Install new cotter pin (16).

GO TO NEXT PAGE

11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40

5. Connect longitudinal servocylinder (17) to longitudinal bellcrank (18).



WARNING

Perform cleaning operation in well ventilated area. Do not breathe abrasive dust; damage to lungs may occur. If injury occurs, seek medical aid.

a. Lightly abrade mating surfaces until old adhesive and surface of bellcrank (18) are free of contaminants (glossy). Use abrasive cloth (E74).

WARNING

Trichloroethane is highly flammable and toxic. Use in well ventilated area, away from open flames. Breathing vapors could cause dizziness. If trichloroethane comes in contact with eyes or skin, flush with water. If trichloroethane comes in contact with eyes or if dizziness occurs, seek medical aid.

b. Wipe bellcrank (18) free of contaminates. Use trichloroethane (E39).

c. Wipe bellcrank (18) dry. Use clean cheesecloth (E31).

d. Allow bellcrank (18) to air dry 30 to 120 minutes.

NOTE

Apply adhesive within 2 hours after solvent cleaning. If adhesive is not applied within 2 hours after solvent cleaning, perform steps b. thru d.

e. Mix adhesive 1 part B to 2 parts A (by weight). Use adhesive (E23).

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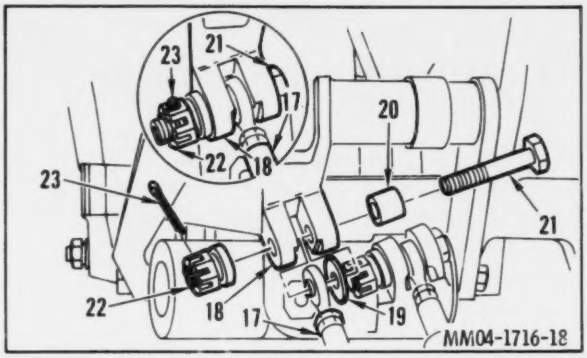
11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40



f. Apply a thin even coat of adhesive (E23) to faying surfaces.

g. Place washer (19) in position on bellcrank (18). Ensure hole alinement. Maintain contact pressure on washer (19) throughout cure time.

h. Wipe adhesive squeeze out away from assembly. Use cheesecloth (E31).

i. Allow adhesive to cure for 24 hours at ambient temperature or force cure for 1 hour at 190 to 210 °F.

j. Aline servocylinder (17) with bellcrank (18).

k. Install bushing (20) in bellcrank (18).

l. Insert bolt (21) through bushing (20), nylon washer (19), bellcrank (18) and servocylinder (17).

m. Hold bolt (21). Install nut (22).

6. Torque nut (22) 900 to 1000 INCH-POUNDS.

a. Hold bolt (21). Use 1-1/16 inch open-end wrench.

b. Torque nut (22) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

c. Increase torque to aline cotter pin holes, but do not exceed **1000 INCH-POUNDS.**

d. Install new cotter pin (23).

GO TO NEXT PAGE

11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40

NOTE

- This task is typical for either lateral link.
- End of link with minimum **Dimension A** shall be connected to swashplate. If both ends have same **Dimension A**, either end may be connected to swashplate.

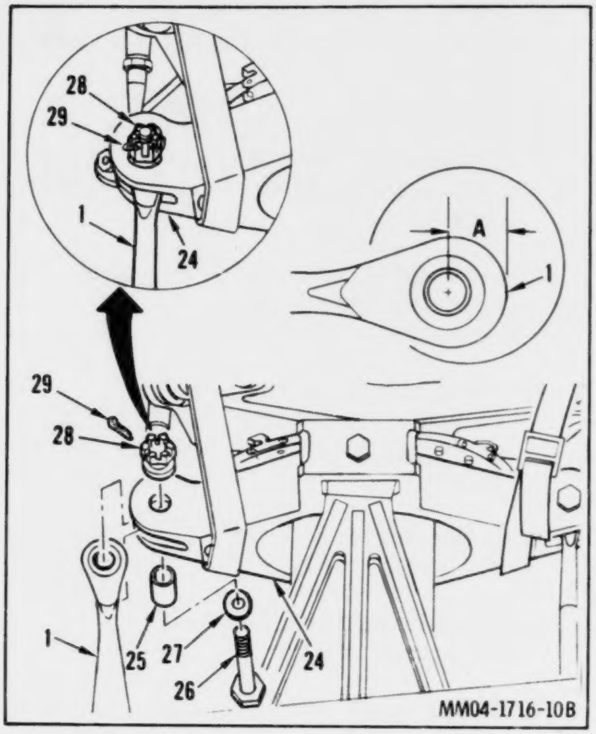
7. **Connect lateral link (1) to swashplate (24).**

   a. Aline link (1) with swashplate (24).

   b. Install bushing (25) in swashplate (24).

   c. Insert bolt (26) through washers (27) (if required), bushing (25), swashplate (24), and link (1).

   d. Hold bolt (26). Install nut (28).



8. **Torque nut (28) 900 to 1100 INCH-POUNDS.**

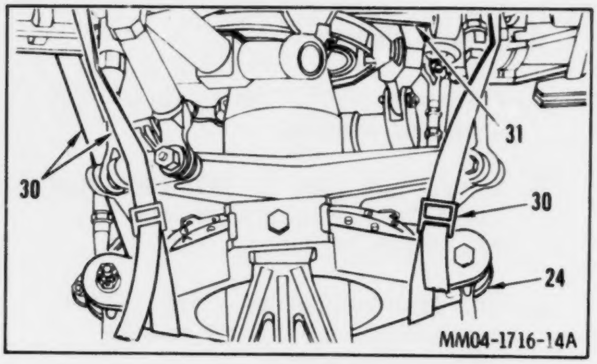
   a. Hold bolt (26). Use 1-1/16 inch open-end wrench.

   b. Torque nut (28) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (29).

9. **Remove cargo straps (30) from main rotor hub (31) and swashplate (24).**



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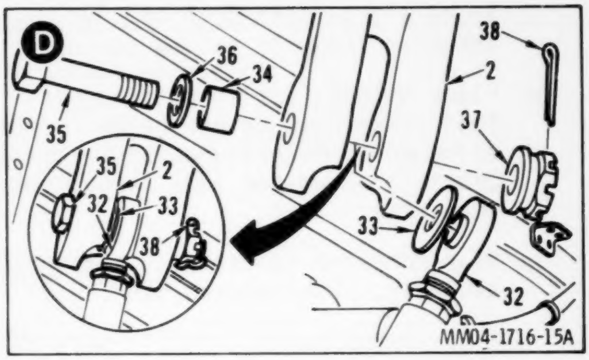
10. Connect lateral servocylinder (32) to lateral bellcrank (2).



WARNING

Perform cleaning operation in well ventilated area. Do not breathe abrasive dust; damage to lungs may occur. If injury occurs, seek medical aid.

a. Lightly abrade mating surfaces until old adhesive and surface of bellcrank (2) are free of contaminants (glossy). Use abrasive cloth (E74).

WARNING

Trichloroethane is highly flammable and toxic. Use in well ventilated area, away from open flames. Breathing vapors could cause dizziness. If trichloroethane comes in contact with eyes or skin, flush with water. If trichloroethane comes in contact with eyes or if dizziness occurs, seek medical aid.

b. Wipe bellcrank (2) free of contaminates. Use trichloroethane (E39).

c. Wipe bellcrank (2) dry. Use clean cheesecloth (E31).

d. Allow bellcrank (2) to air dry 30 to 120 minutes.

NOTE

Apply adhesive within 2 hours after solvent cleaning. If adhesive is not applied within 2 hours after solvent cleaning, perform steps b. thru d.

e. Mix adhesive, 1 part B to 2 parts A (by weight). Use adhesive (E23).

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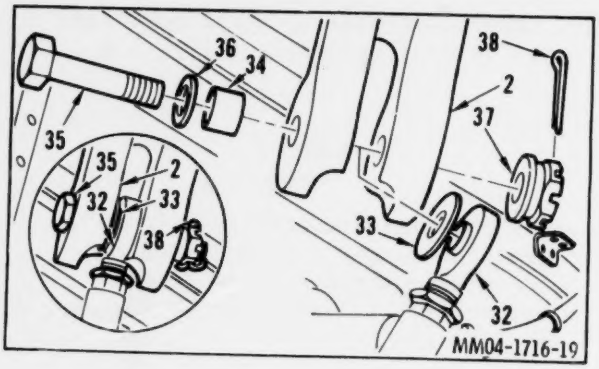
11-3-40. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION (cont) 11-3-40



f. Apply a thin even coat of adhesive (E23) to mating surfaces.

g. Place washer (33) in position on bellcrank (2). Ensure hole alinement. Maintain contact pressure on washer (33) throughout cure time.

h. Wipe adhesive squeeze out away from assembly. Use cheesecloth (E31).

i. Allow adhesive to cure 24 hours at ambient temperature or force cure for 1 hour at 190 to 210° F.

j. Aline servocylinder (32) with bellcrank (2).

k. Install bushing (34) in bellcrank (2).

l. Insert bolt (35) through washers (36) (if required), bushing (34), bellcrank (2), nylon washer (33), and servocylinder (32).

m. Hold bolt (35). Install nut (37).

11. **Torque nut (37) 900 to 1000 INCH-POUNDS.**

    a. Hold bolt (35). Use 1-1/16 inch open-end wrench.

    b. Torque nut (37) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

    c. Increase torque to aline cotter pin holes, but do not exceed **1000 INCH-POUNDS.**

    d. Install new cotter pin (38).

12. **Install two longitudinal links** (para 11-3-38).

13. **Inspect (TI).**

14. **Perform flight control system operational check** (TM 55-1520-238-T).

15. **Secure access panels L200, R200; and doors T250L, T250R, T290L, T290R, and L325** (para 2-2-2).

END OF TASK

11-3-41. TORQUE LINK REMOVAL/INSTALLATION 11-3-41

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Wrench, Torque, 3/8 Drive	5120-00-821-3441
Wrench, Torque, 1/2 Drive	5120-00-270-3121
Socket, 1-1/2, 1/2 Drive	5120-00-277-4465

Materials/Parts:

Cotter Pin (3)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

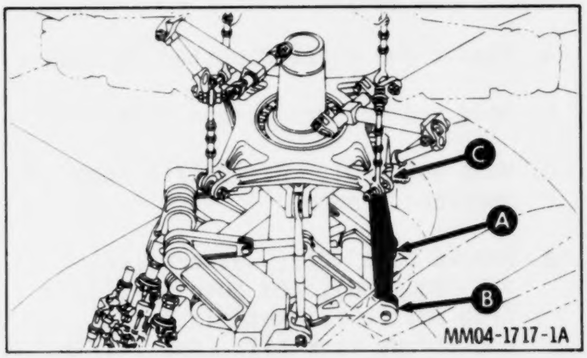
References:

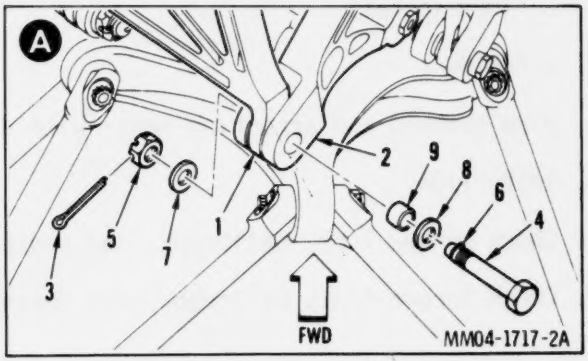
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T290R,T290L, T290R, L325 open; and fairings T205L and T205R removed

A. **REMOVAL**





1. **Disconnect torque link (1) from right side of aft longitudinal bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4) and loosen nut (5). Use 1-1/16 inch wrench and 1-1/2 inch socket.

   CAUTION

   To prevent damage to self-retaining bolt, press retention device lock fully when removing bolt.

   c. Press retaining device (6) on bolt (4) remove nut (5) and washer (7).

   d. Remove bolt (4), washers (8) (if required), and spacer (9).

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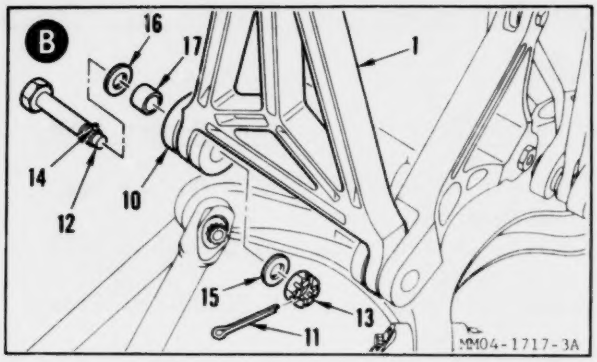
11-3-41. TORQUE LINK REMOVAL/INSTALLATION (cont) 11-3-41



2. **Disconnect torque link (1) from left side of bellcrank (10).**

   a. Remove and discard cotter pin (11).

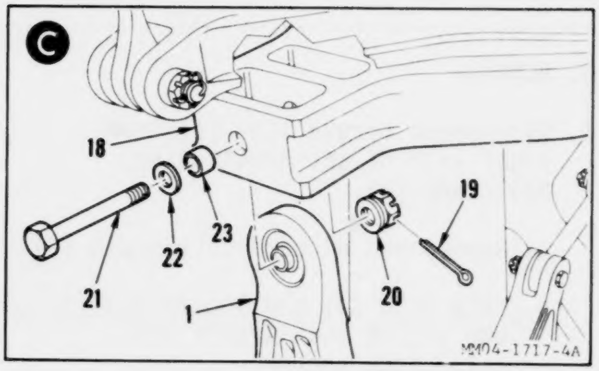
   b. Hold bolt (12). Loosen nut (13). Use 1-1/16 inch open-end wrench and 1-1/2 inch socket.

   CAUTION

   To prevent damage to self-retaining bolt, press retention device lock fully when removing bolt.

   c. Press retaining device (14) on bolt (12). Remove nut (13) with washer (15).

   d. Remove bolt (12), washers (16) (if required), and spacer (17).



3. **Remove torque link (1) from swashplate (18).**

   a. Remove and discard cotter pin (19).

   b. Hold and support torque link (1).

   c. Hold nut (20). Use 1-1/16 inch open-end wrench.

   d. Remove bolt (21), washers (22) (if required), and bushing (23) from nut (20), swashplate (18), and torque link (1). Use 1-1/16 inch socket.

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check torque link, bellcrank, and swashplate for damage** (para 11-3-1).

2. **Check torque link, bellcrank, and swashplate for corrosion** (para 1-5-38).

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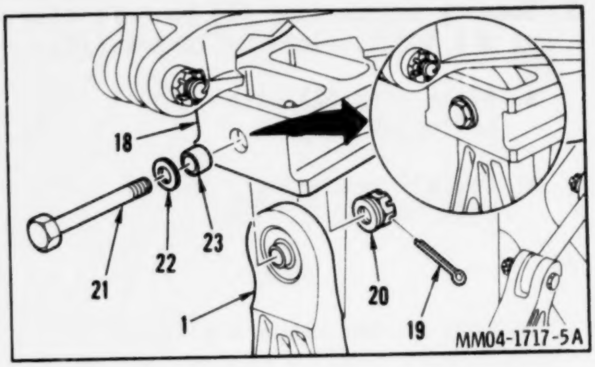
11-3-41. TORQUE LINK REMOVAL/INSTALLATION (cont) 11-3-41



D. INSTALLATION

1. **Install torque link (1) on swashplate (18).**

   a. Aline and hold link (1) with swashplate (18).

   b. Install bushing (23) in swashplate (18).

   c. Position and hold nut (20).

   d. Install bolt (21) through washers (22) (if required), bushing (23), swashplate (18), link (1), and nut (20).

2. **Torque bolt (21) 900 to 1100 INCH-POUNDS.**

   a. Hold nut (20). Use 1-1/16 inch open-end wrench.

   b. Torque bolt (21) to **900-INCH POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (19).

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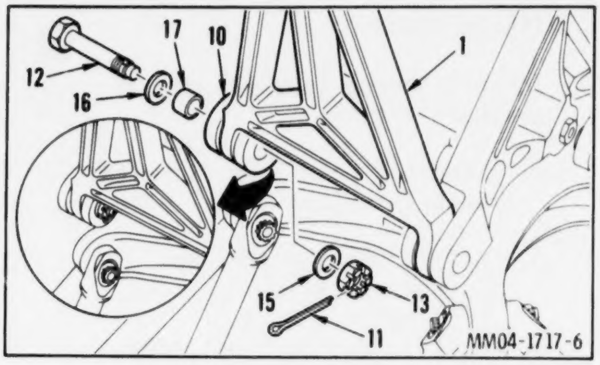
11-3-41. TORQUE LINK REMOVAL/INSTALLATION (cont) 11-3-41



3. **Connect torque link (1) to left side of aft longitudinal bellcrank (10).**

   a. Aline link (1) with bellcrank (10).

   b. Install spacer (17) in bellcrank (10).

   NOTE

   Maximum of two washers allowed under bolt head to ensure bearing clamp-up and pin alinement.

   c. Insert bolt (12) through washers (16) (if required), spacer (17), bellcrank (10), and link (1).

   d. Hold bolt (12).

   e. Install washer (15) and nut (13).

4. **Torque nut (13) 300 to 700 INCH-POUNDS.**

   a. Hold bolt (12). Use 1-1/16 inch open-end wrench.

   b. Torque nut (13) to **300 INCH-POUNDS.** Use 1-1/2 inch socket and 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **700 INCH-POUNDS.**

   d. Install new cotter pin (11).

5. **Inspect (TI).**

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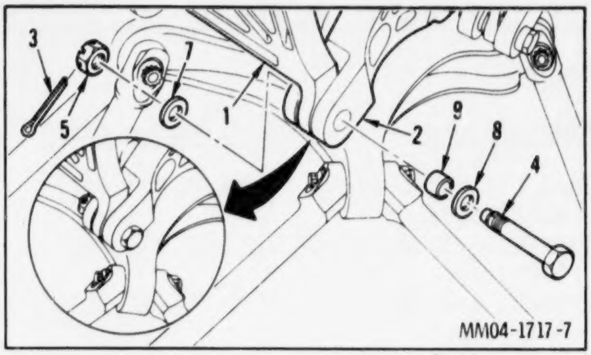
11-3-41. TORQUE LINK REMOVAL/INSTALLATION (cont) 11-3-41



6. **Connect torque link (1) to right side of bellcrank (2).**

   a. Aline link (1) with bellcrank (2).

   b. Install spacer (9) in bellcrank (2).

   c. Insert bolt (4) through washer (8) (if required), spacer (9), bellcrank (2), and link (1).

   d. Hold bolt (4).

   e. Install washer (7) and nut (5).

7. **Torque nut (5) 300 to 700 INCH-POUNDS.**

   a. Hold bolt (4). Use 1-1/16 inch open-end wrench.

   b. Torque nut (5) to **300 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **700 INCH-POUNDS.**

   d. Install cotter pin (3).

8. **Inspect (TI).**

9. **Secure access doors T250L, T250R, T290L, T290R, L325; fairings T205L and T205R** (para 2-2-2).

10. **Perform flight control system operational check** (TM 55-1520-238-T).

END OF TASK

11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION 11-3-42

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Socket, 1-7/16, 3/4 Drive	5120-00-189-7931
Wrench, 1-7/16 & 1-3/8 inch Open-end	5120-00-277-2324
Wrench, Torque, 1/2 Drive	5120-00-270-3121
Wrench, Torque, 3/8 Drive	5120-00-821-3441
Wrench, Torque, 3/4 Drive	5120-00-902-3550

Materials/Parts:

	Cotter Pin (3)
(E23)	Adhesive
(E31)	Cheesecloth
(E39)	Trichloroethane
(E74)	Abrasive cloth

Personnel Required:

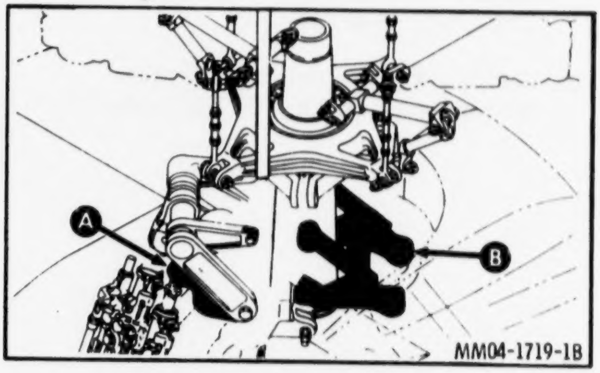
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-39	Lateral bellcrank and lateral links removed
11-3-41	Torque link assembly removed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 opened; panels L200, R200 and fairings T205L, T205R removed
11-3-38	Longitudinal link removed



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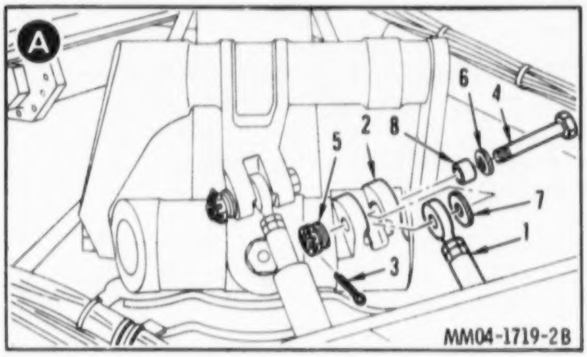
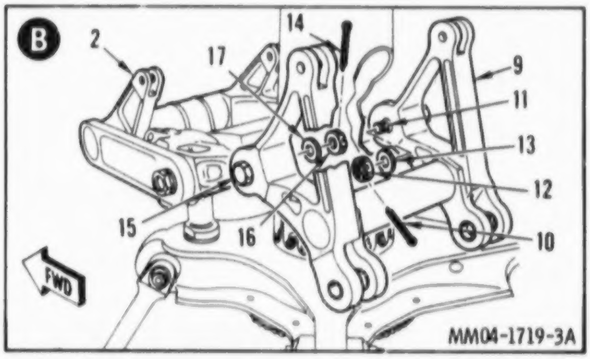
11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION (cont) 11-3-42

A. REMOVAL





WARNING

To prevent bellcrank movement and possible injury, support bellcrank before disconnecting servocylinder. If injury occurs, seek medical aid.

CAUTION

To prevent damage to rigid hydraulic tubes, ensure upper end of servocylinder is supported when rod end is disconnected from the bellcrank.

1. **Disconnect servocylinder (1) from bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5). Use 1-1/6 inch open-end wrench and 1-1/16 inch socket.

NOTE

Do not remove nylon washer (7) unless it is loose or excessively worn.

   c. Remove bolt (4), washers (6) (if required), nylon washer (7), and bushing (8).

2. **Disconnect bellcrank (9) right side from bellcrank (2).**
   a. Remove and discard cotter pin (10).
   b. Hold bolt (11). Use 1-7/16 inch socket.
   c. Remove nut (12) and washer (13). Use 1-7/16 inch open-end wrench.

3. **Disconnect bellcrank (9) left side from bellcrank (2).**
   a. Remove and discard cotter pin (14).
   b. Hold bolt (15). Use 1-7/16 inch socket.
   c. Remove nut (16) and washer (17). Use 1-7/16 inch open-end wrench.

GO TO NEXT PAGE

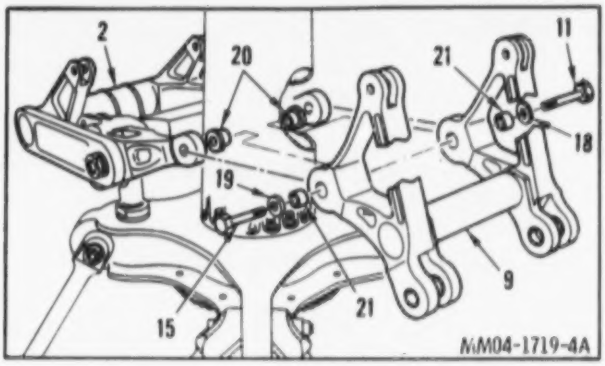
NOTE

Do not remove bolt until bellcrank is to be removed from helicopter.

4. **Remove bellcrank (9) from bellcrank (2).**

   a. Position and support bellcrank (2) to allow removal of bolts (11) and (15).

   b. Remove two bolts (11), (15), washers (18), (19) (if installed), two bushings (20), and two spacers (21).



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B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check bellcranks for damage and wear** (para 11-3-1).

2. **Check bellcranks for corrosion** (para 1-5-38).

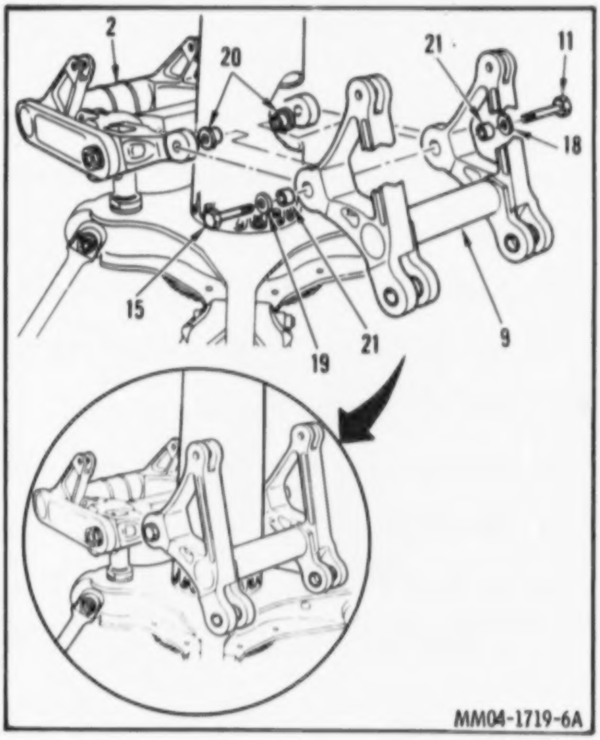
D. **INSTALLATION**

1. **Connect bellcrank (9) to bellcrank (2).**

   a. Install two spacers (21) and two bushings (20) in bellcrank (9).

   b. Aline bellcrank (9) with bellcrank (2) and hold in place.

   c. Insert two bolts (11) and (15) through washers (18) and (19) (if required), spacers (21), bushings (20), bellcrank (9), and bellcrank (2).



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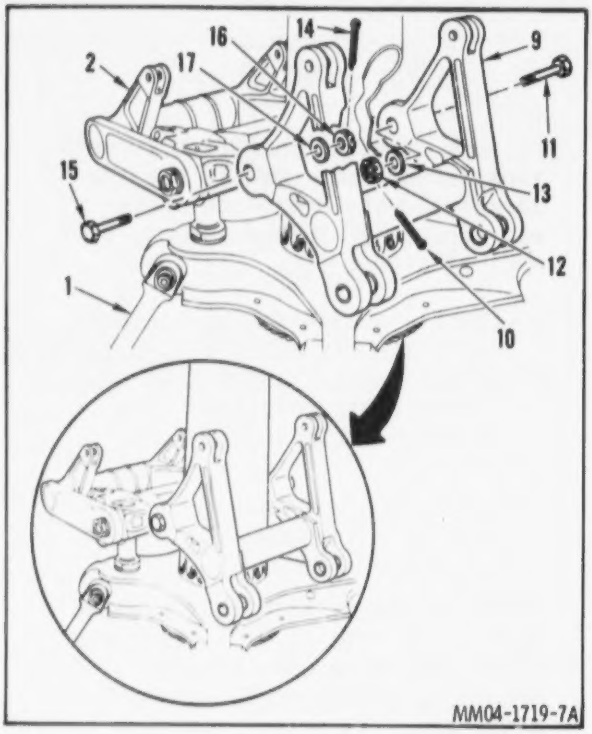
11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION (cont) 11-3-42



WARNING

Perform cleaning operation in well ventilated area. Do not breathe abrasive dust; damage to lungs may occur.

d. Lightly abrade mating surfaces until the old adhesive and surface of bellcrank (2) are free of contaminants (glossy). Use abrasive cloth (E74).

2. **Install washers (13) and (17), and nuts (12) and (16) on bolts (11) and (15).**

a. Hold bolts (11) and (15).

b. Install washer (13) and nut (12) on bolt (11).

c. Install washer (17) and nut (12) on bolt (15).

3. **Torque bolts (11) and (15) 300 to 700 INCH-POUNDS.**

a. Hold nuts (12) and (16). Use 1-7/16 inch open-end wrench.

b. Torque bolts (11) and (15) to **300 INCH-POUNDS**. Use 1-7/16 inch socket and 3/4 drive torque wrench.

c. Increase torque to aline cotter pin holes, but do not exceed **700 INCH-POUNDS**.

d. Install new cotter pins (10) and (14).

4. **Connect servocylinder (1) to bellcrank (2).**

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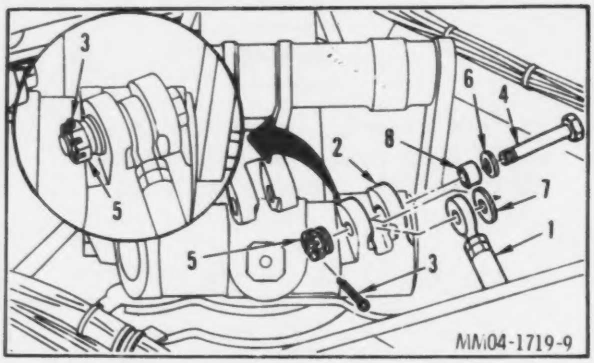
11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION (cont) 11-3-42



WARNING

Perform cleaning operation in well ventilated area. Do not breathe abrasive dust; damage to lungs may occur. If injury occurs, seek medical aid.

a. Lightly abrade mating surfaces until the old adhesive and surface of bellcrank (2) are free of contaminants (glossy). Use abrasive cloth (E74).

WARNING

Trichloroethane is highly flammable and toxic. Use in well ventilated area, away from open flames. Breathing vapors could cause dizziness. If trichloroethane comes in contact with eyes or skin, flush with water. If trichloroethane comes in contact with eyes or if dizziness occurs, seek medical aid.

b. Wipe bellcrank (2) free of contaminants. Use trichloroethane (E39).

c. Wipe bellcrank (2) dry. Use clean cheesecloth (E31).

d. Allow bellcrank (2) to air dry 30 to 120 minutes.

NOTE

Apply adhesive within 2 hours after solvent cleaning. If adhesive is not applied within 2 hours after solvent cleaning, perform steps b. thru d.

e. Mix adhesive, 1 part B to 2 parts A (by weight). Use adhesive (E23).

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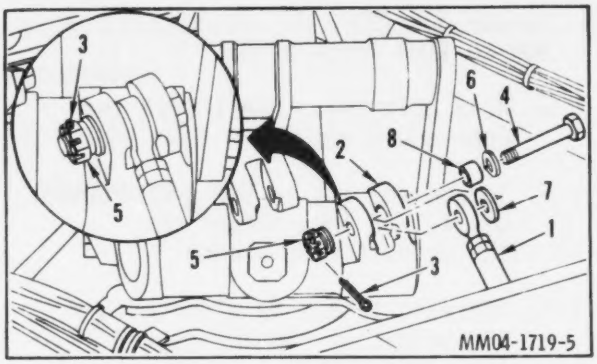
11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION (cont) 11-3-42



f. Apply a thin even coat of adhesive (E23) to mating surfaces.

g. Place washer (7) in position on bellcrank (2). Ensure hole alinement. Maintain contact pressure on washer (7) throughout cure time.

h. Wipe adhesive squeeze out away from assembly. Use cheesecloth (E31).

i. Allow adhesive to cure 24 hours at room temperature or force cure for 1 hour at 190 to 210 °F.

j. Aline servocylinder (1) with bellcrank (2).

k. Install bushing (8) in bellcrank (2).

l. Insert bolt (4) through washers (6) (if required), bushing (8), nylon washer (7), bellcrank (2), and actuator (1).

m. Hold bolt (4). Install nut (5).

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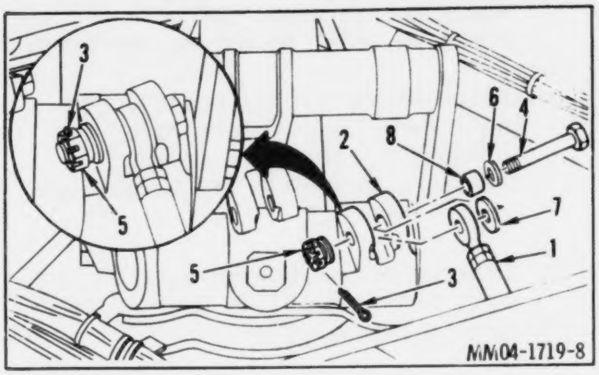
11-3-42. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION (cont) 11-3-42



5. **Torque nut (5)**
   900 to 1100 INCH-POUNDS.

   a. Hold bolt (4). Use 1-1/16 inch open-end wrench.

   b. Torque nut (5) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (3).

6. **Install torque link** (para 11-3-41).

7. **Install lateral bellcrank and lateral links** (para 11-3-40).

8. **Install longitudinal links** (para 11-3-38).

9. **Inspect** (TI).

10. **Perform flight control system operational check** (TM 55-1520-238-T).

11. **Secure access doors T250L, T250R, T290L, T290R, L325: fairings T205L, T205R, and panels L200 and R200** (para 2-2-2).

END OF TASK

11-3-43. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION 11-3-43

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-821-3441

Materials/Parts:

Cotter Pin (3)
Washer, Laminated (2)

Personnel Required:

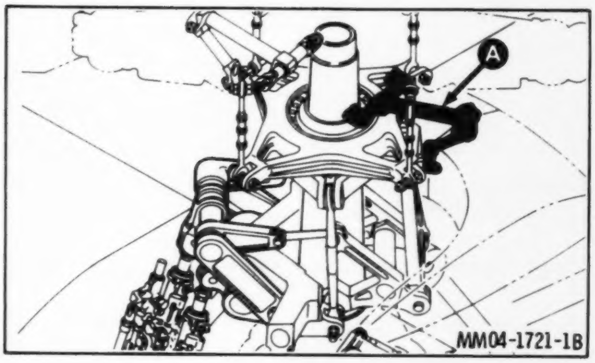
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R and L325 removed



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11-3-43. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-43

A. REMOVAL

1. **Disconnect one side of load-bearing main rotor scissor (1) from main rotor hub lower shoe (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4).

   c. Remove nut (5) and washer (6).

   d. Remove bolt (4), washer (7), laminated washer (8), bearing (9), and bushing (10).

2. **Disconnect other side of scissor (1) from hub lower shoe (2).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (12).

   c. Remove nut (13) and washer (14).

   d. Remove bolt (12), washer (15), laminated washer (16), bearing (17), and bushing (18).

3. **Remove scissor (1) from swashplate (19).**

   a. Remove and discard cotter pin (20).

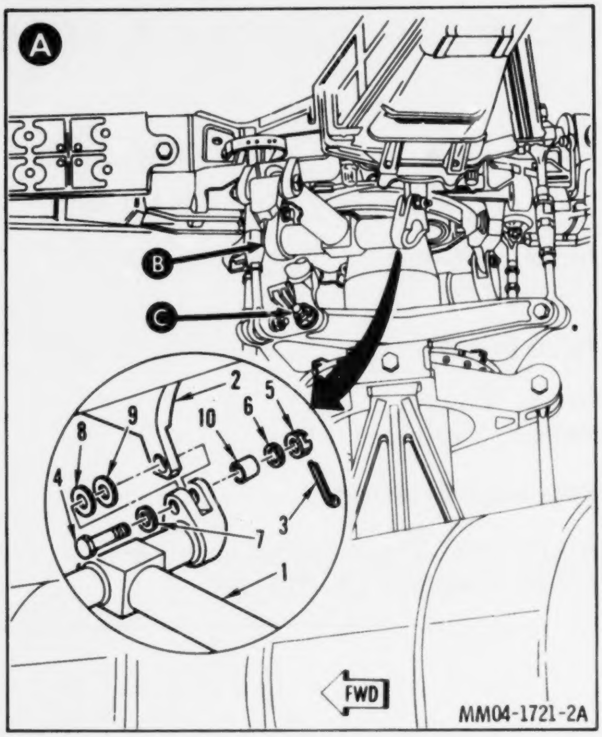
   b. Hold bolt (21).

   c. Remove nut (22), washer (23) and retaining washer (24).

   d. Remove scissor (1) and washer (25) from swashplate (19).

B. CLEANING

Wipe removed parts and attaching parts with a clean rag.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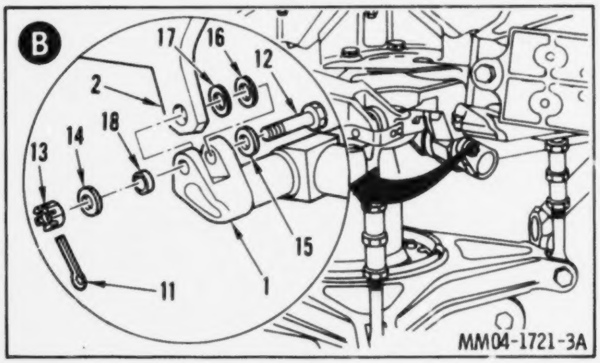
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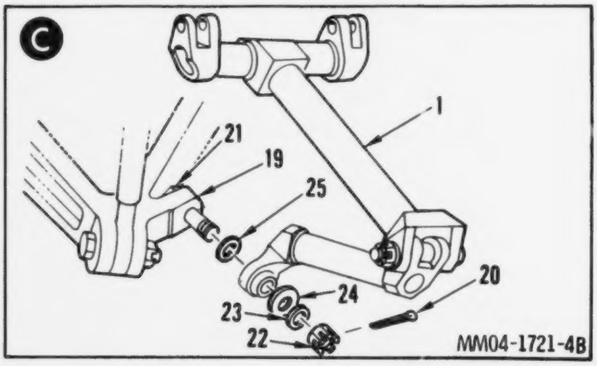
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11-3-43. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-43

C. INSPECTION

1. **Check bearing bore and surrounding area for scratches, cracks, wear, and elongation.** Damage in a bore area within 1-1/2 times the bore diameter is not to exceed 10% of the material thickness or **0.040-inch,** whichever is less.

2. **Check bearing and bushing for wear.**

   a. Maximum allowable radial play with bolt in bushing or bearing inside diameter is **0.004-inch.**

   b. Maximum allowable radial play with sliding bushing in flanged inside diameter is **0.004-inch.**

3. **Check for corrosion** (para 1-5-38).

D. INSTALLATION

1. **Aline load bearing main rotor scissor (1) with mounting points on main rotor hub lower shoe (2).**

2. **Connect one side of scissor (1) to lower shoe (2).**

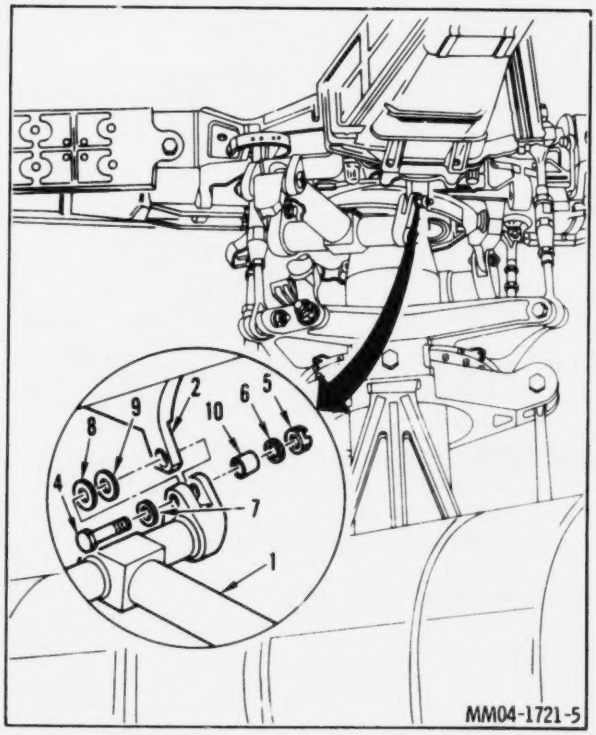
   a. Position bearing (9) and washer (8) between scissor (1) and shoe (2).

   b. Install bushing (10) in scissors (1) and shoe (2).

   c. Insert bolt (4) through washer (7), scissor (1), washer (8), bearing (9), bushing (10), scissor (1).

   d. Hold bolt (4).

   e. Install washer (6) and nut (5) on bolt (4).



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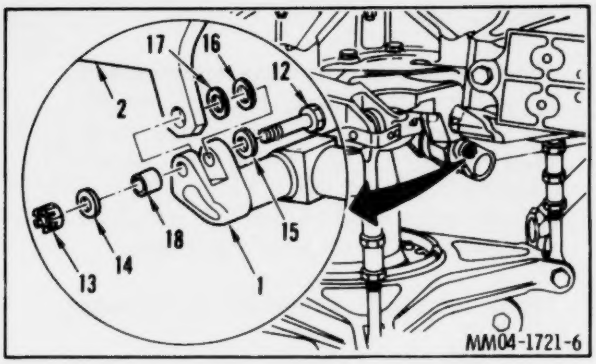
11-3-43. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-43

3. **Connect other side of scissor (1) to shoe (2).**
   a. Position bearing (17) and washer (16) between scissor (1) and shoe (2).
   b. Install bushing (18) in scissor (1) and shoe (2).
   c. Insert bolt (12) through washer (15), scissor (1), washer (16), bearing (17), bushing (18), scissor (1), and washer (14).
   d. Hold bolt (12).
   e. Install nut (13) on bolt (12).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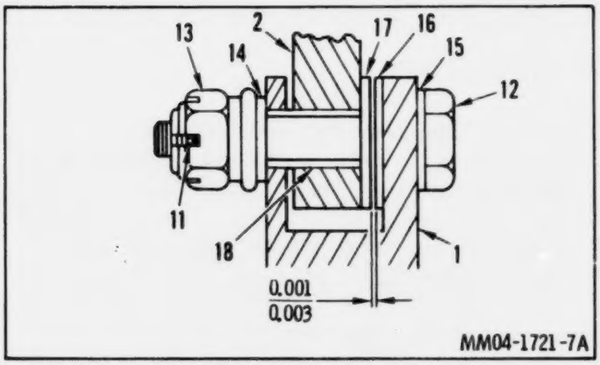
4. **Check for 0.001 to 0.003-INCH clearance between scissor (1) and shoe (2).**
   a. Measure clearance between bearing (17) and washer (16). Go to step 5 if clearance is within limits.
   b. Measure clearance between bearing (9) and laminated washer (10). Go to step D5 if clearance is in limits.
   c. Remove scissor (1) from shoe (2) if clearance not within limits.
   d. Peel laminated washers to proper thickness. Use equal thickness laminated washers within **0.002-INCH** on both sides.
   e. Perform step (D3).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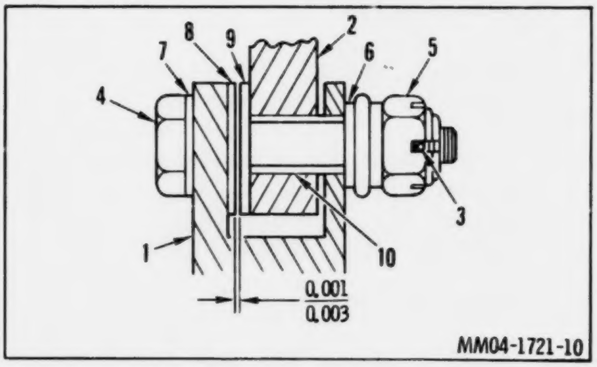
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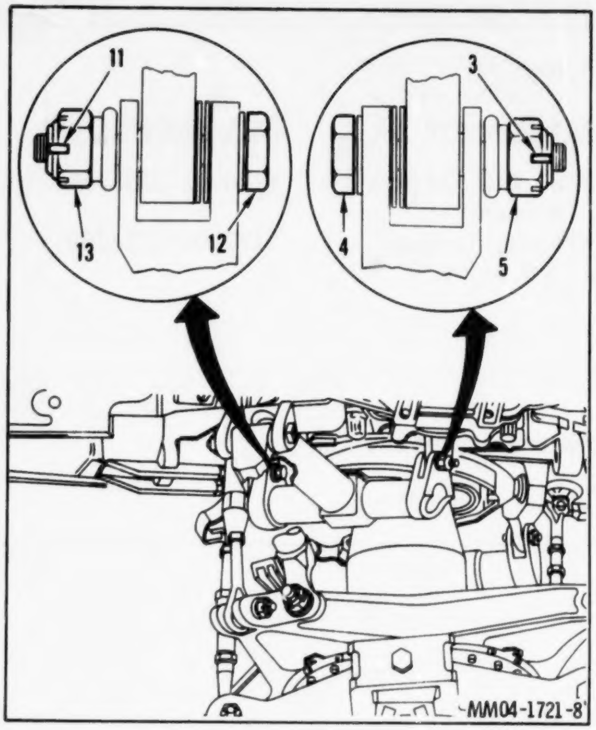
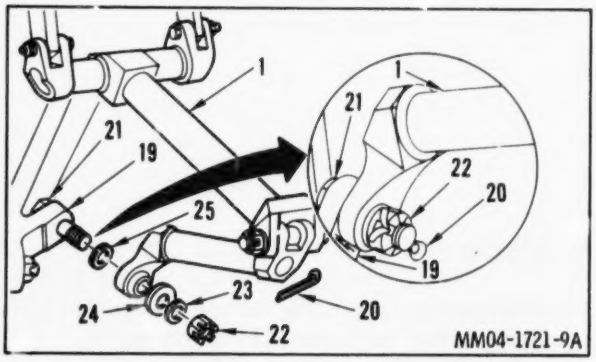
11-3-43. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-43

5. **Torque nuts (5) and (13) 170 to 200 INCH-POUNDS.**
   a. Hold two bolts (4) and (12).
   b. Torque nuts (5) and (13) to **170 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **200 INCH-POUNDS.**
   d. Install new cotter pins (3) and (11).
6. **Recheck clearance measured in step D4.** If **0.001 to 0.003-INCH** is maintained go to step 7. If clearance has changed repeat steps 4 and 5.
7. **Install scissor assembly (1) on swashplate (19).**
   a. Position washer (25) and scissor (1) on swashplate (19).
   b. Install washer (24), washer (23), and nut (22).
8. **Torque nut (22) 250 to 300 INCH-POUNDS.**
   a. Hold bolt (21).
   b. Torque nut (22) to **250 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **300 INCH-POUNDS.**
   d. Install new cotter pin (20).
9. **Inspect (TI).**
10. **Perform flight control system operational check** (TM 55-1520-238-T).
11. **Secure access doors T250L, T250R, T290L, T290R and L325** (para 2-2-2).

END OF TASK





11-3-44. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION 11-3-44

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-821-3441

Materials/Parts:

Cotter Pin (3)

Personnel Required:

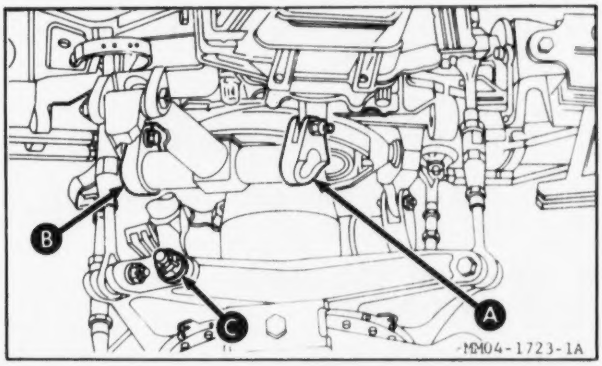
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

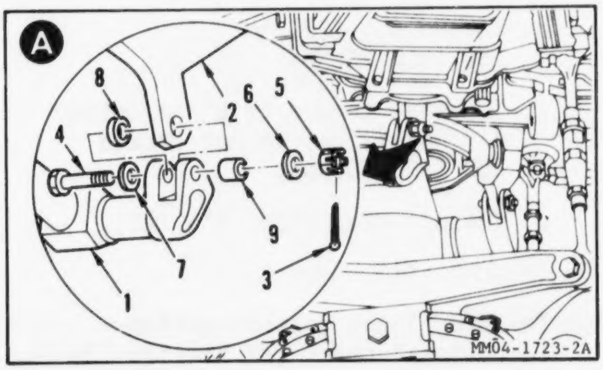
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 removed





A. REMOVAL

1. **Disconnect one side of secondary main rotor scissor (1) from main rotor hub lower shoe (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4).
   c. Remove nut (5) and washer (6).
   d. Remove bolt (4), washer (7), bearing (8), and bushing (9).

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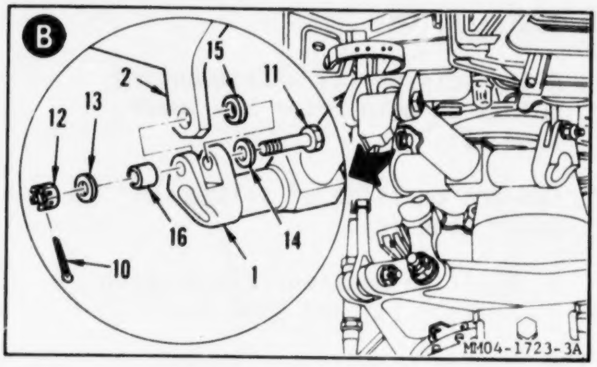
11-3-44. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-44



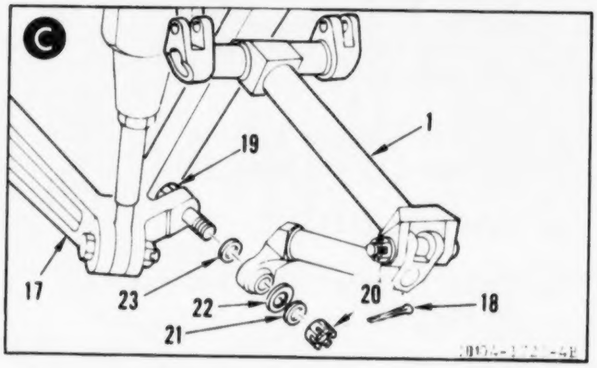
2. **Disconnect other side of scissor (1) from lower shoe (2).**

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11).

   c. Remove nut (12) and washer (13).

   d. Remove bolt (11), washer (14), bearing (15), and bushing (16).



3. **Remove scissor (1) from swashplate (17).**

   a. Remove and discard cotter pin (18).

   b. Hold bolt (19).

   c. Remove nut (20), washer (21), and retaining washer (22).

   d. Remove scissor (1) and washer (23) from swashplate (17).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bearing bore and surrounding area for scratches, cracks, wear, and elongation.** Damage in a bore area within 1-1/2 times bore diameter is not to exceed 10% of material thickness or **0.040-inch**, whichever is less.

2. **Check bearing and bushing for wear.**

   a. Maximum allowable radial play with bolt in bushing or bearing inside diameter is **0.004-inch.**

   b. Maximum allowable radial play with sliding bushing in flanged inside diameter is **0.004-inch.**

3. **Check for corrosion** (para 1-5-38).

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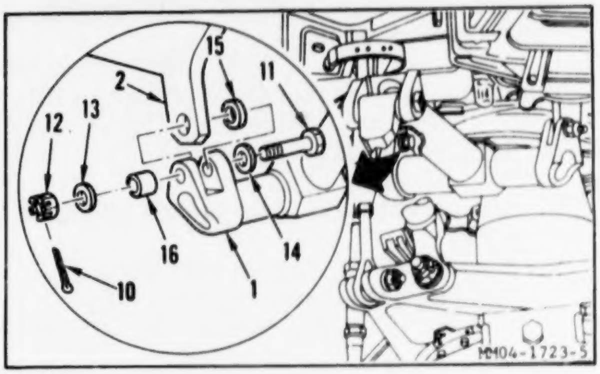
11-3-44. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-44

D. INSTALLATION



1. **Aline scissor (1) with mounting points on main rotor hub lower shoe (2).**

2. **Connect one side of scissor (1) to lower shoe (2).**

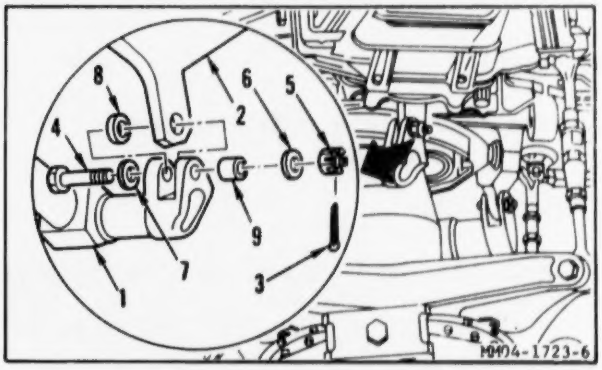
   a. Position bearing (15) between scissor (1) and shoe (2).

   b. Insert bolt (11) through washer (14), scissor (1), bearing (15), bushing (16), and shoe (2).

   c. Install bushing (16) in scissor (1) and shoe (2).

   d. Hold bolt (11).

   e. Install washer (13) and nut (12) on bolt (11).



3. **Connect other side of scissor (1) to hub lower shoe (2).**

   a. Position bearing (8) between scissor (1) and shoe (2).

   b. Insert bolt (4) through washer (7), scissor (1), bearing (8), and shoe (2).

   c. Install bushing (9) in scissor (1) and shoe (2).

   d. Hold bolt (4).

   e. Install washer (6) and nut (5) on bolt (4).

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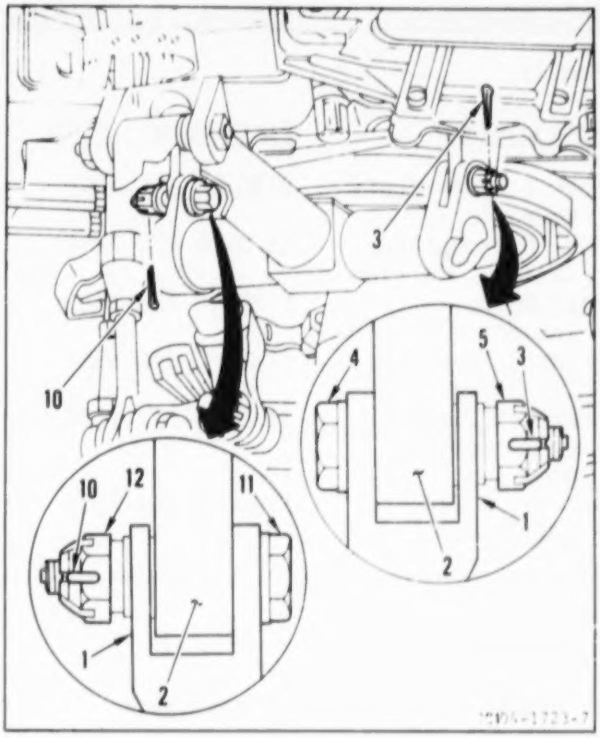
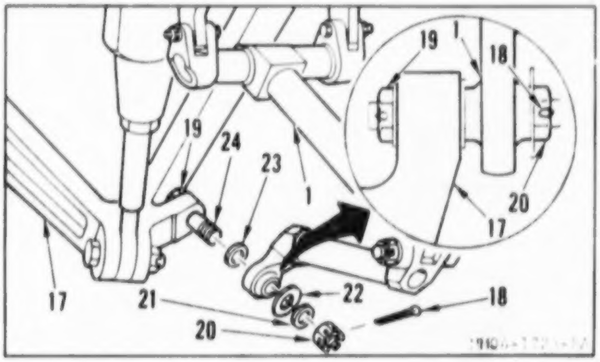
11-3-44. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION (cont) 11-3-44

4. **Torque nuts (5) and (12) 170 to 200 INCH-POUNDS.**
   a. Hold two bolts (4) and (11).
   b. Torque nuts (5) and (12) to **170 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **200 INCH-POUNDS.**
   d. Install new cotter pins (3) and (10).
5. **Install scissor (1) on swashplate (17).**
   a. Position washer (23) and scissor (1) on swashplate pin (24).
   b. Install retaining washer (22), washer (21), and nut (20).
6. **Torque nut (20) 250 to 300 INCH-POUNDS.**
   a. Hold bolt (19).
   b. Torque nut (20) to **250 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **300 INCH-POUNDS.**
   d. Install new cotter pin (18).
7. **Inspect (TI).**
8. **Perform flight control system operational check** (TM 55-1520-238-T).
9. **Secure access doors T250L, T250R, T290L, T290R, and L325** (para 2-2-2).





END OF TASK

11-3-45. LOAD BEARING SCISSOR REPLACEMENT 11-3-45

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Set, Micrometer, Caliper, Outside	5120-00-554-7134
Micrometer, Inside	5120-00-221-1921
Wrench, Torque, 1/2 Drive	5120-00-640-6364
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Socket, 1-1/4, 1/2 Drive	5120-00-189-7917

Materials/Parts:

Cotter Pin

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-43	Load bearing main rotor scissor removed

A. REMOVAL

1. **Remove lower arm (1) from upper arm (2).**

   a. Remove and discard cotter pin (3).

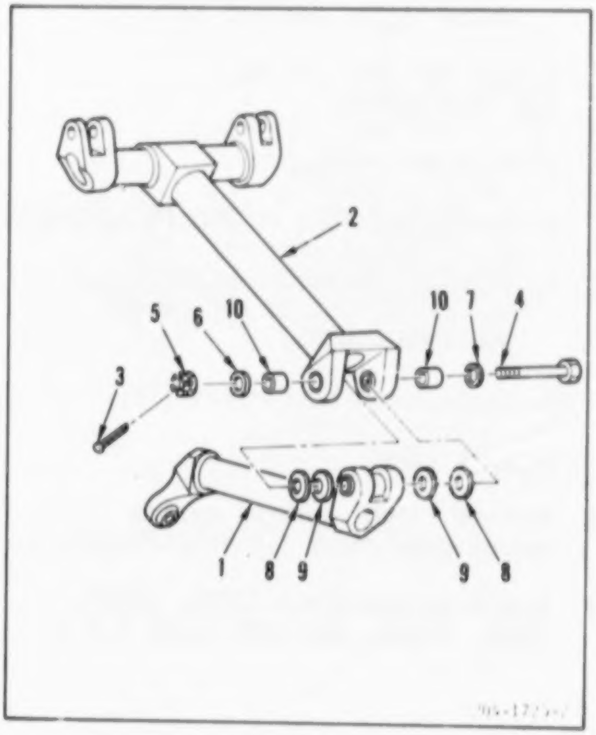
   b. Hold bolt (4). Use 1-1/4 inch open-end wrench.

   c. Remove nut (5) and washer (6). Use 1-1/4 inch socket.

   d. Remove bolt (4), flat washer (7), two bearings (8), two laminated washers (9) and two bushings (10).

B. CLEANING

Wipe removed and attaching parts with a clean rag.



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C. INSPECTION

1. **Check lower arm bearing bore and surrounding area for scratches, cracks, wear, and elongation.** Damage in a bore area within 1-1/2 times bore diameter is not to exceed 10% of material thickness or **0.040-inch**, whichever is less.

2. **Check bearing and bushing for wear.**

   a. Maximum allowable radial play with bolt in bushing or bearing inside diameter is **0.004-inch.**

   b. Maximum allowable radial play with sliding bushing in flanged inside diameter is **0.004-inch.**

3. **Check for corrosion** (para 1-5-38).

D. INSTALLATION

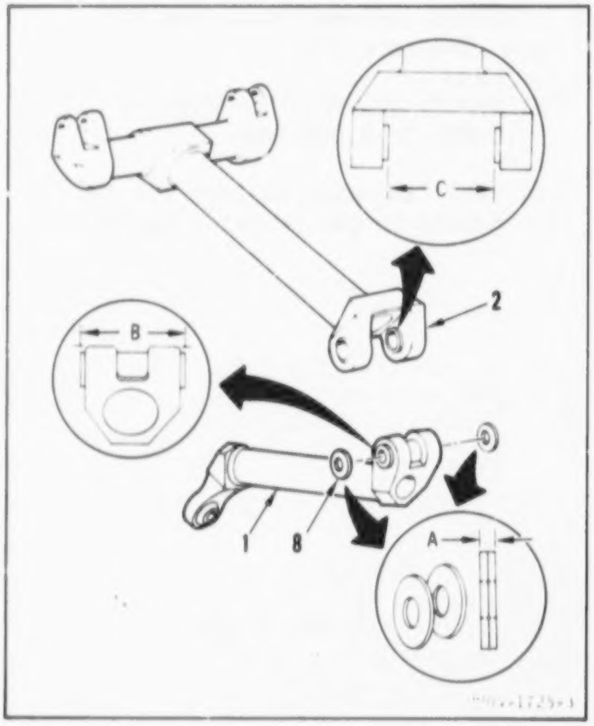
1. **Measure clearance between lower arm (1) and upper arm (2).**

   a. Measure combined thickness of two bearings (8). Record this as Dimension A. Use outside micrometer set.

   b. Measure width of lower arm (1) lug. Record this as Dimension B. Use outside micrometer set.

   c. Measure inside dimension of upper arm (2). Record this as Dimension C. Use inside micrometer set.

   d. Subtract total of Dimensions A and B from Dimension C. The result equals combined thickness of two laminated washers plus axial play. Record measurement for reference during assembly.



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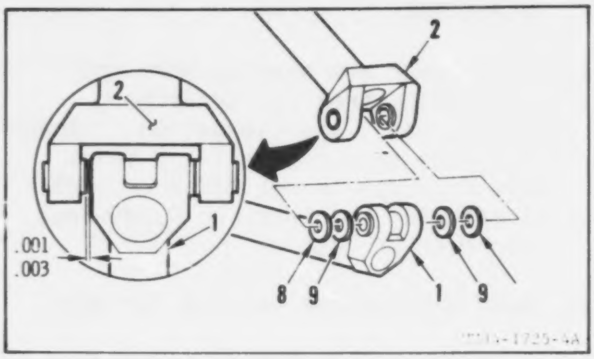
11-3-45. LOAD BEARING SCISSOR REPLACEMENT (cont) 11-3-45

NOTE

Refer to notes taken when measuring clearance to get proper laminated washer thickness.



2. **Install lower arm (1) on upper arm (2).**

   a. Aline lower arm (1) with upper arm (2).

NOTE

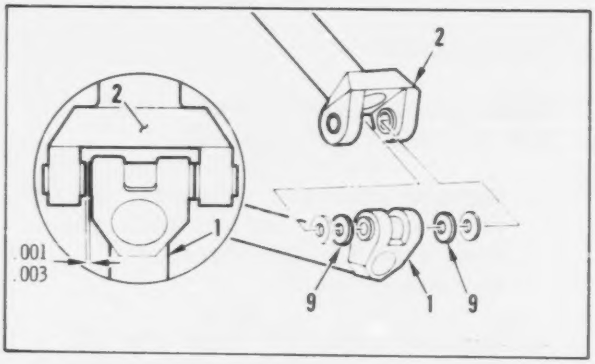
Use laminated washers of equal thickness to limit axial play to **0.001 to 0.003-inch.**

   b. Position two laminated washers (9) and two bearings (8).

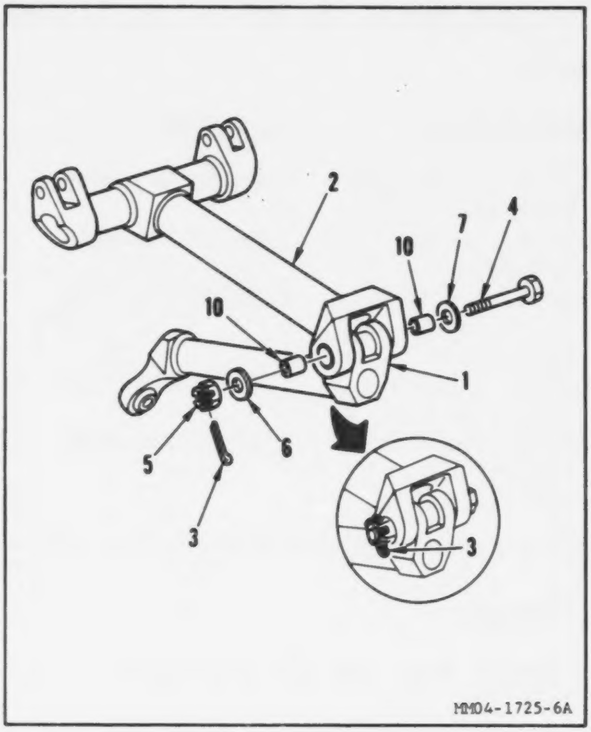
3. **Check for 0.001 to 0.003-inch clearance between upper arm (2) and lower arm (1).**

   a. Verify proper axial play of **0.001 to 0.003-inch.**

   b. Peel laminated washers (9) as needed to get proper clearance.



11-3-45. LOAD BEARING SCISSOR REPLACEMENT (cont) 11-3-45



4. **Install two bushings (10) in upper arm (2).**

5. **Install washer (7) and bolt (4) with countersunk side of washer adjacent to bolt head through upper arm (2) and lower arm (1).**

   a. Hold bolt (4).

   b. Install washer (6) and nut (5).

6. **Torque nut (5) 100 to 200 INCH-POUNDS.**

   a. Hold bolt (4). Use 1-1/4 inch open-end wrench.

   b. Torque nut (5) to **100 INCH-POUNDS.** Use 1-1/4 inch socket.

   c. Increase torque to aline cotter pin holes, but do not exceed **200 INCH-POUNDS.**

   d. Install new cotter pin (3).

7. **Inspect (TI).**

8. **Install load bearing main rotor scissor** (para 11-3-43).

END OF TASK

11-3-46. SECONDARY SCISSOR REPLACEMENT 11-3-46

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-288-8865
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Socket, 1-1/4, 1/2 Drive	5120-00-189-7917
Adapter, Socket Wrench 3/8, 1/2 Drive	5120-00-240-8702

Materials/Parts:

Cotter Pin

Personnel Required:

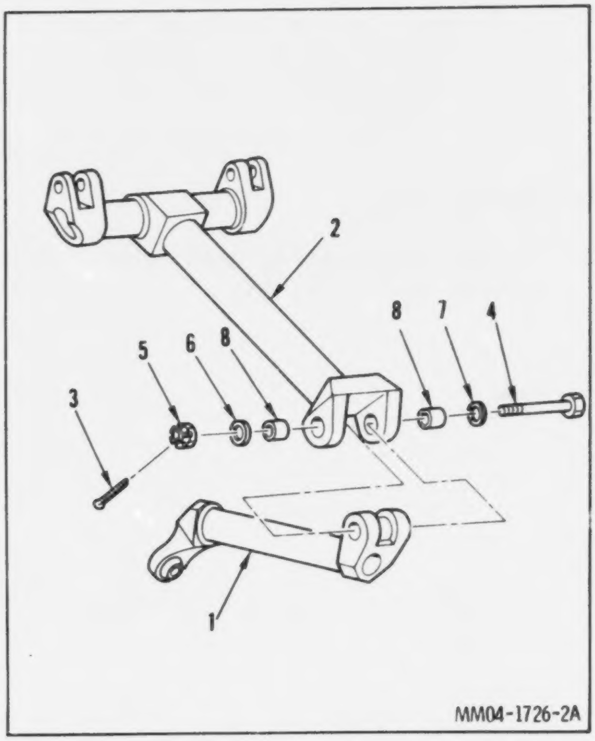
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-44	Secondary main rotor scissor removed

A. REMOVAL

1. **Remove lower arm (1) from upper arm (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Use 1-1/4 inch open-end wrench.
   c. Remove nut (5) and washer (6). Use 1-1/4 inch socket.
   d. Remove bolt (4), flat washer (7), and two bushings (8).



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B. CLEANING

Wipe removed and attaching parts with a clean rag (para 1-5-36).

C. INSPECTION

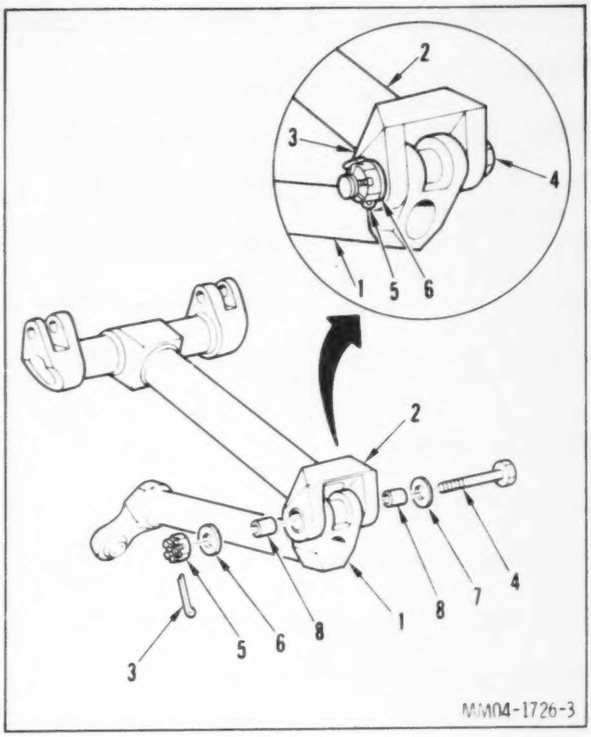
1. Check lower arm bearing bore and surrounding area in lower arm for scratches, cracks, wear, and elongation. Damage in bore area within 1-1/2 times bore diameter is not to exceed 10% of material thickness or 0.040-inch whichever is less.

2. Check bearing and bushing for wear.

   a. Maximum allowable radial play with bolt in bushing or bearing inside diameter is 0.004-inch.

   b. Maximum allowable radial play with sliding bushing in flanged inside diameter is 0.004-inch.

3. Check for corrosion (para 1-5-38).



D. INSTALLATION

1. Install lower arm (1) on upper arm (2).

   a. Aline lower arm (1) with upper arm (2).

   b. Install two bushings (8) in upper arm (2).

   c. Insert bolt (4) through washer (7) with countersunk side of washer adjacent to bolt head, upper arm (2), and lower arm (1).

   d. Hold bolt (4).

   e. Install washer (6) and nut (5).

2. Torque nut (5) 100 to 200 INCH-POUNDS.

   a. Hold bolt (4). Use 1-1/4 inch open-end wrench.

   b. Torque nut (5) to 100 INCH-POUNDS. Use 1-1/4 inch socket and socket adapter.

   c. Increase torque to aline cotter pin holes, but do not exceed 200 INCH-POUNDS.

   d. Install new cotter pin (3).

3. Inspect (TI).

4. Install secondary main rotor scissor (para 11-3-44).

END OF TASK

11-3-47. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION 11-3-47

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, 1-5/8 & 1-13/16 Open-end	5120-00-081-9099
Socket, 1-13/16, 3/4 Drive	5120-00-199-7768
Wrench, Torque, 3/4 Drive	5120-00-902-3550

Materials/Parts:

Cotter Pin (2)

Personnel Required:

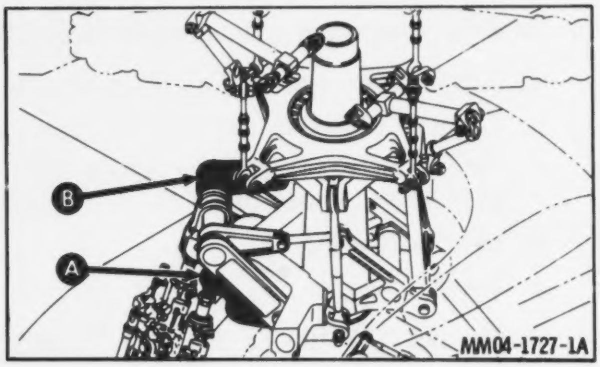
67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels L200 and R200 removed; access doors T250L, T250R, T290L, T290R, L325 opened; fairings T205L and T205R removed
11-3-39	Lateral bellcrank and lateral links removed
11-3-38	Longitudinal links removed
11-3-42	Aft longitudinal bellcrank removed



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11-3-47. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION (cont) 11-3-47

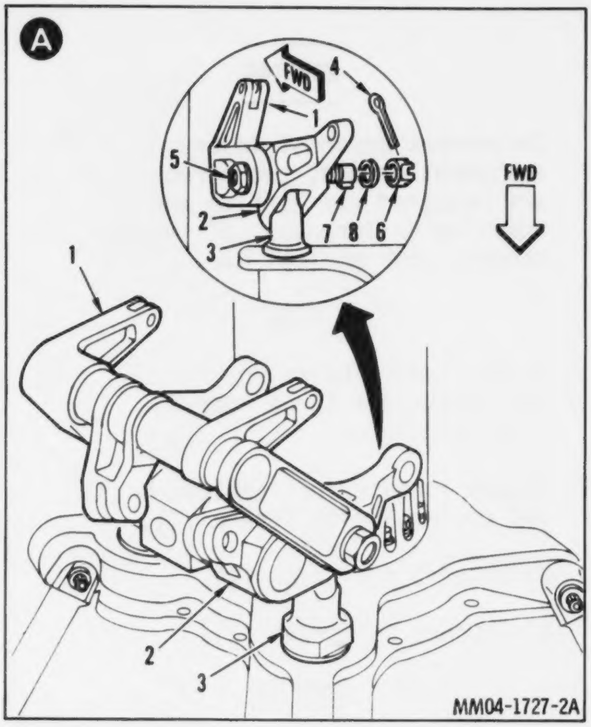
A. REMOVAL

1. **Disconnect longitudinal bellcrank (1) and collective bellcrank (2) from left mixer support (3).**

   a. Remove and discard cotter pin (4).

   b. Hold bolt (5). Loosen nut (6). Use 1-13/16 inch open-end wrench and 1-13/16 inch socket.

   c. Press retention device (7). Remove nut (6) and washer (8).



NOTE

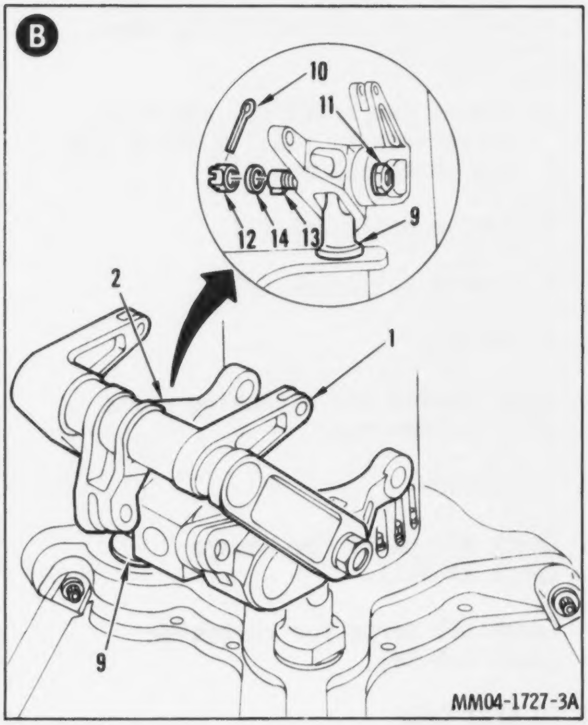
Do not remove right mixer support bolt until left bolt is to be removed.

2. **Disconnect bellcranks (1) and (2) from right mixer support (9).**

   a. Remove cotter pin (10).

   b. Hold bolt (11). Loosen nut (12).

   c. Press retention device (13). Remove nut (12) and washer (14). Use 1-13/16 inch open-end wrench and 1-13/16 inch socket.



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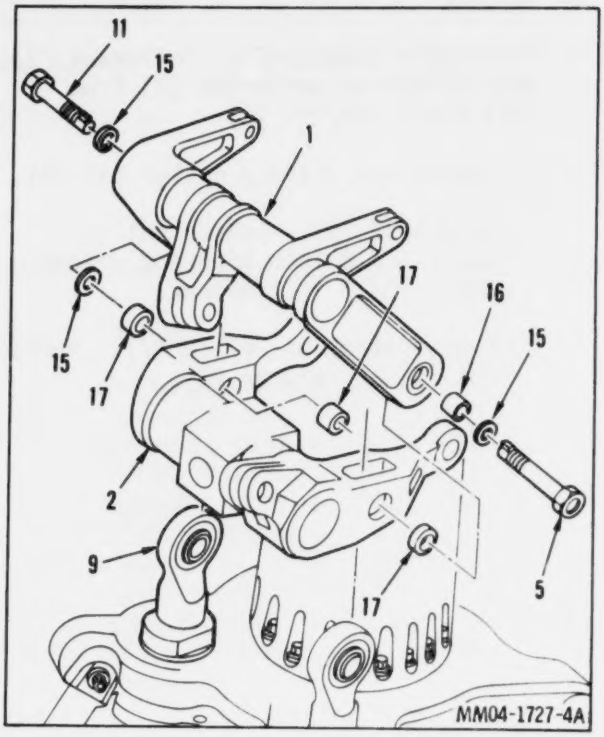
11-3-47. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION (cont)



WARNING

To prevent personal injury or equipment damage, two persons are required for lifting and removing bellcranks. If injury occurs, seek medical aid.

NOTE

Do not remove bolts until bellcranks are to be removed from helicopter.

3. **Remove longitudinal bellcrank (1) and collective bellcrank (2).**

   a. Support bellcrank (1).

   b. Support bellcrank (2).

CAUTION

To prevent damage to bolt, press retention device lock fully when removing bolt.

   c. Remove two bolts (5) and (11), three washers (15), bushing (16), and three spacers (17).

   d. Remove bellcrank (1).

   e. Remove bellcrank (2).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check all parts for damage** (para 11-3-1).

2. **Check all parts for corrosion** (para 1-5-38).

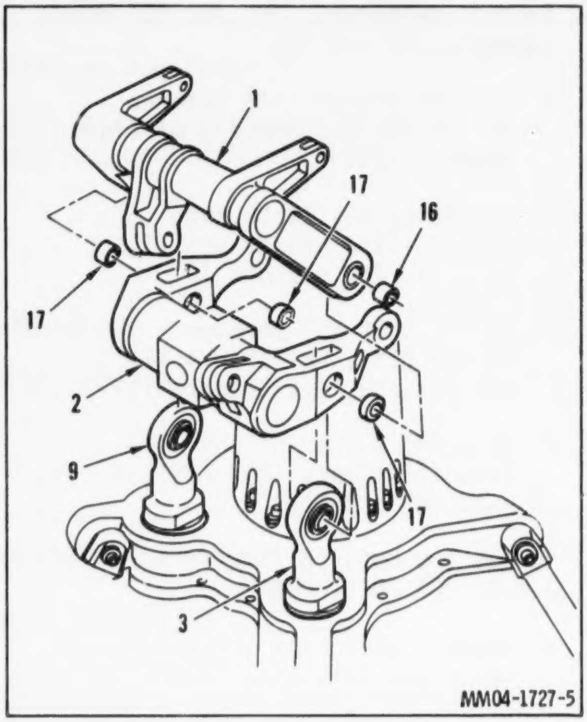
GO TO NEXT PAGE

11-3-47. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION (cont) 11-3-47

D. INSTALLATION

WARNING

To prevent personal injury or equipment damage, two persons are required for lifting and positioning bellcranks. If injury occurs, seek medical aid.



1. Position bellcrank (2) and bellcrank (1) for installation on mixer supports (3) and (9).
   a. Install spacers (17) in bellcrank (2).
   b. Install bushing (16) in bellcrank (1).
   c. Aline and hold bellcrank (2) with supports (3) and (9).
   d. Aline and hold bellcrank (1) with supports (3) and (9), and bellcrank (2).

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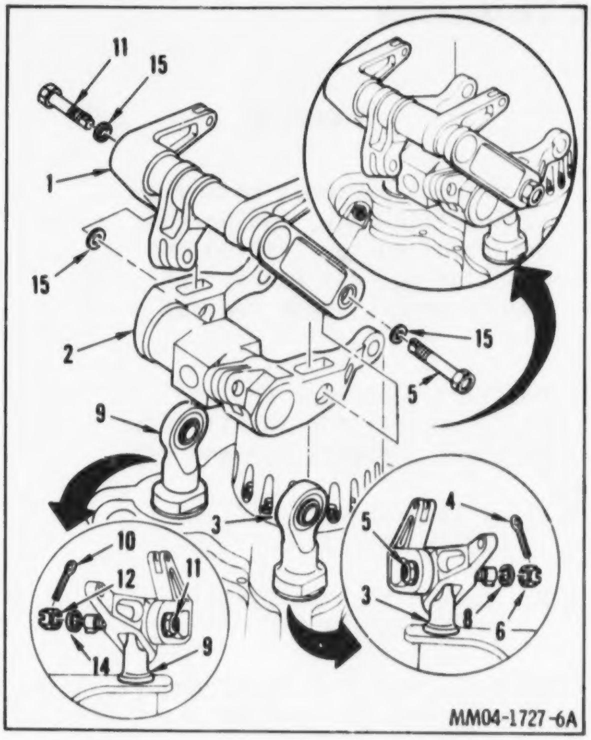
11-3-47. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION (cont) 11-3-47



2. **Install bellcranks (1) and (2) on supports (3) and (9).**
   a. Install washer (15) between bellcranks (1) and (2) on right support (9).
   b. Insert bolt (11) through washer (15), bellcranks (1) and (2), and support (9).
   c. Insert bolt (5) through washer (15), bellcranks (1) and (2) and left support (3).
   d. Hold two bolts (5) and (11). Install washers (8), (14), nuts (6) and (12).

3. **Torque two nuts (6) and (12) 175 to 200 FOOT-POUNDS.**
   a. Support bellcrank (2) and bellcrank (1).
   b. Hold bolts (5) and (11). Use 1-13/16 inch open-end wrench.
   c. Torque two nuts (6) and (12) to **175 FOOT-POUNDS.**
   d. Increase torque to aline cotter pin holes, but do not exceed **200 FOOT-POUNDS.**
   e. Install two new cotter pins (4) and (10).

4. **Install aft longitudinal bellcrank** (para 11-3-42).

5. **Install lateral bellcrank and lateral links** (para 11-3-40).

6. **Install longitudinal links** (para 11-3-38).

7. **Inspect (TI).**

8. **Perform flight control system operational check** (TM 55-1520-238-T).

9. **Secure access doors T250L, T250R, T290L, T290R and L325; fairings T205L, T205R; access panels L200, and R200** (para 2-2-2).

END OF TASK

11-3-48. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION 11-3-48

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Wrench, 1-5/16 & 1-1/4 inch Open-end	5120-00-277-2321
Crowfoot Attachment 1-5/16, 1/2 Drive	5120-00-184-8409
Wrench, Torque, 1/2 Drive	5120-00-270-3121

Materials/Parts:

	Cotter Pin (2)
(E29)	Lockwire

Personnel Required:

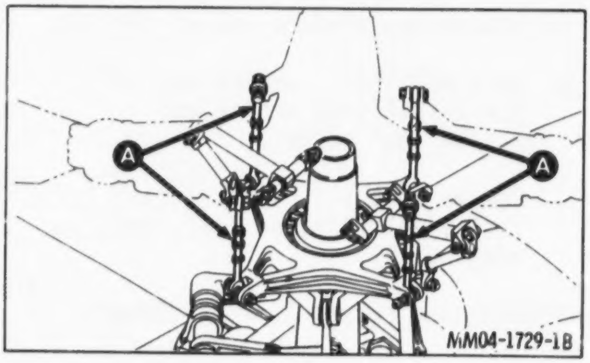
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 removed



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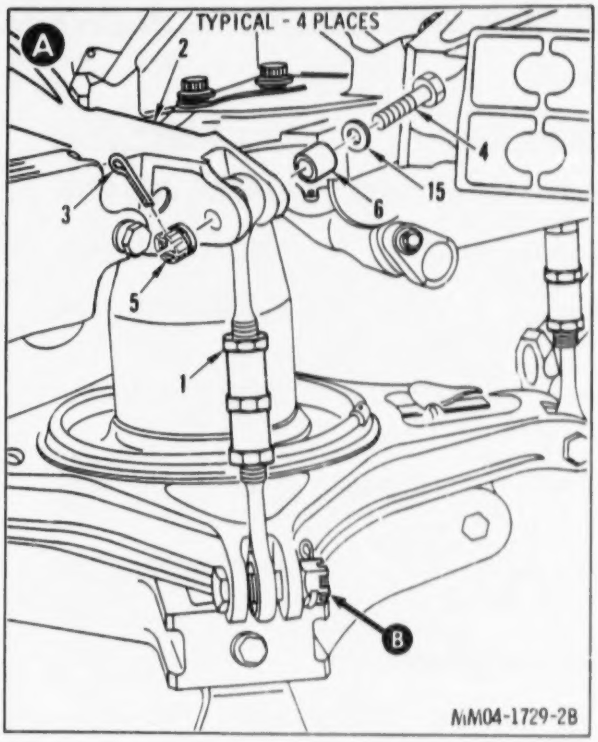
11-3-48. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION (cont) 11-3-48

A. REMOVAL


A
TYPICAL - 4 PLACES
2
3
4
15
6
5
1
B
MM04-1729-2B

NOTE

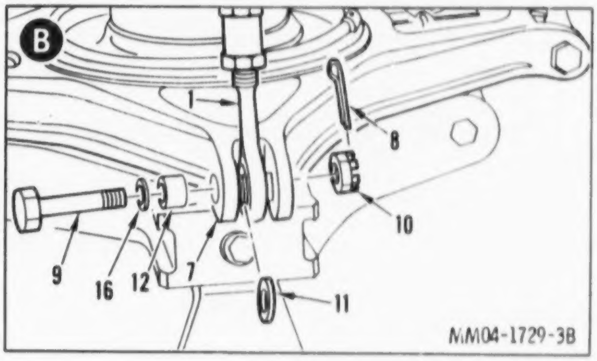
This task is typical for all four pitch links.

1. **Disconnect main rotor pitch link (1) from pitch change horn (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5). Use 1-1/16 inch wrench and 1-1/16 inch socket.

   c. Remove bolt (4), washers (15) (if installed), and bushing (6).

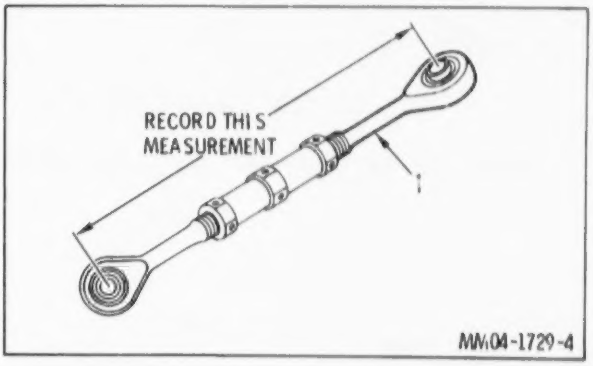

B
1
8
10
9
16
12
7
11
MM04-1729-3B

2. **Disconnect link (1) from swashplate (7).**

   a. Remove and discard cotter pin (8).

   b. Hold bolt (9). Remove nut (10). Use 1-1/16 inch wrench and 1-1/16 inch socket.

   c. Remove bolt (9), washers (16) (if installed), limiter (11), and bushing (12).


RECORD THIS MEASUREMENT
1
MM04-1729-4

3. **Measure and record link (1) length.**

   a. Measure center-to-center distance between bearing bolt holes.

   b. Record distance for reference during installation.

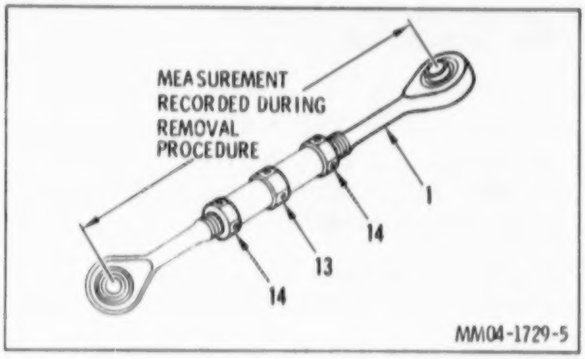
GO TO NEXT PAGE

11-3-48. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION (cont) 11-3-48

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION



1. **Check rod end bearing for wear and freedom of movement.**
   - a. Maximum allowable radial play is **0.017-inch.**
   - b. Maximum allowable axial play is **0.030-inch.**
2. **Check rod end for stripped or damaged threads.** Rod end threads should be snug but free to turn in barrel (para 11-3-1).
3. **Check barrel for cracks and stripped or damaged threads.** Gouges and scratches not to exceed **0.003-inch** in depth and **0.025-inch** in length.
4. **Check for corrosion** (para 1-5-38).

D. INSTALLATION

1. **Measure length of main rotor pitch link (1).** Measure center-to-center distance between rod-end bolt holes in link (1).

NOTE

If distance is exactly the same as that for pitch link removed, omit steps 2 and 3.

2. **Adjust length of link (1).**
   - a. Remove lockwire.
   - b. Hold barrel at wrench flats (13). Use 1-5/16 inch wrench.
   - c. Loosen two nuts (14). Use 1-5/16 inch crowfoot.

NOTE

Refer to measurement recorded during removal for correct length.

   - d. Secure ends of link (1).
   - e. Adjust length of link (1) by rotating barrel (13) until desired length is obtained.
   - f. Hold barrel at wrench flats (13).
   - g. Tighten two nuts (14).

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3. **Torque two nuts (14) to 900 INCH-POUNDS.**

   a. Hold barrel at wrench flats (13). Use 1-5/16 inch wrench.

   b. Torque two nuts (14) to **900 INCH-POUNDS.** Use 1-5/16 inch crowfoot attachment.

4. **Lockwire two nuts (14) to barrel wrench flats (13).** Use lockwire (E29).

5. **Connect link (1) to pitch change horn (2).**

   a. Position link (1) so that left-hand threaded rod end is on top side of barrel and alined with pitch change horn (2).

   b. Install bushing (6) in pitch change horn (2).

NOTE

A maximum of two washers (15) are allowed under bolt head (if required) to ensure bushing clamp-up and pin hole alinement.

   c. Insert bolt (4) through washer (15), pitch change horn (2), bushing (6), and link (1) (para 11-2-1).

   d. Hold bolt (4).

   e. Install nut (5).

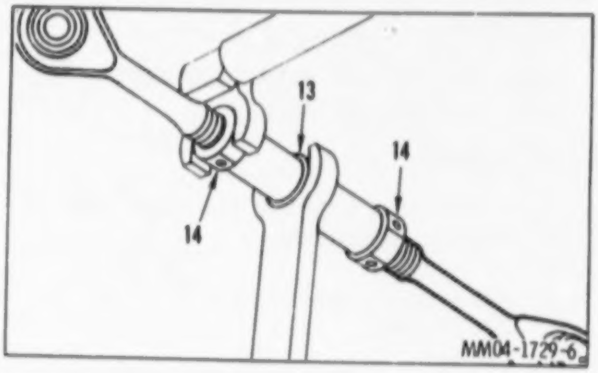
6. **Torque nut (5) 900 to 1100 INCH-POUNDS.**

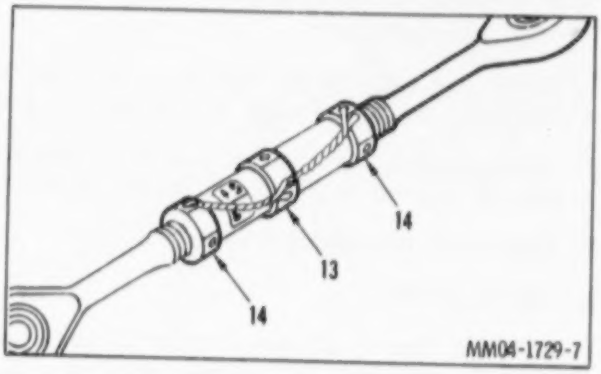
   a. Hold bolt (4). Use 1-1/16 inch wrench.

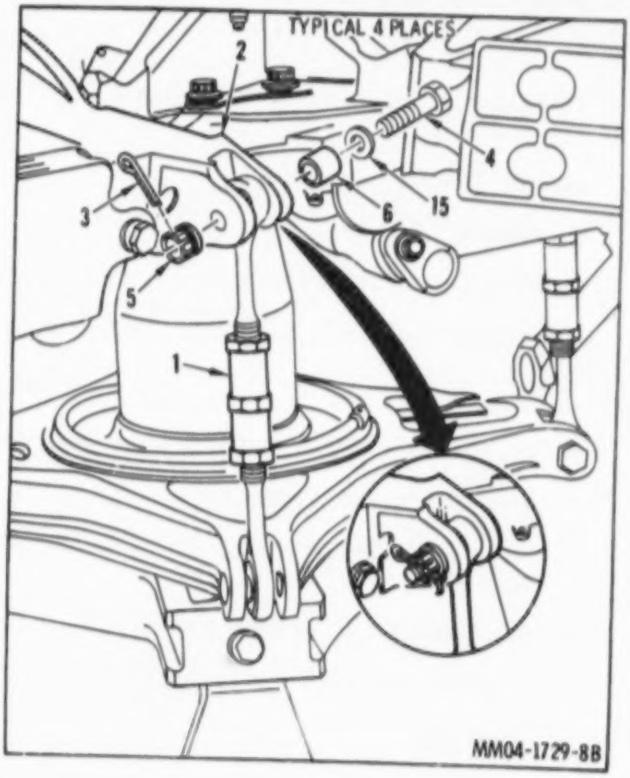
   b. Torque nut (5) to **900 INCH-POUNDS.** Use 1-1/16 inch socket.

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (3).







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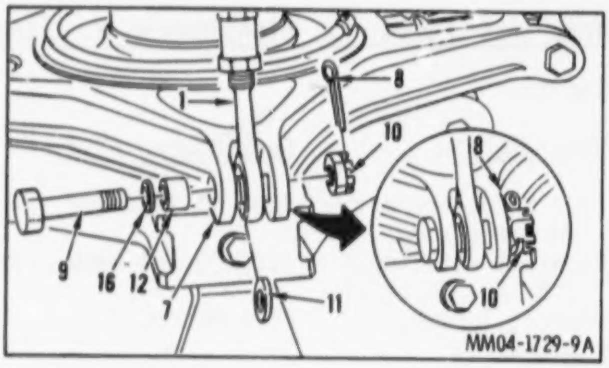
11-3-48. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION (cont) 11-3-48

7. **Connect link (1) to swashplate (7).**



   a. Aline link (1) and limiter (11) with swashplate (7).

   b. Install bushing (12) in swashplate (7).

NOTE

A maximum of two washers (16) is allowed under bolt head (if required) to ensure bushing clamp-up and pin hole alinement.

   c. Insert bolt (9) through washer (16), link (1), bushing (12), limiter (11), and swashplate (7) (para 11-2-1).

   d. Hold bolt (9). Install nut (10).

8. **Torque nut (10) 900 to 1100 INCH-POUNDS.**

   a. Hold bolt (9). Use 1-1/16 inch wrench.

   b. Torque nut (10) to **900 INCH-POUNDS.**

   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (8).

9. **Inspect (TI).**

10. **Perform flight control system operational check** (TM 55-1520-238-T).

11. **Perform main rotor track and balance operational check** (TM 55-1520-238-T).

12. **Secure access doors T250L, T250R, T290L, T290R, and L325** (para 2-2-2).

END OF TASK

11-3-49. MAIN ROTOR PITCH LINK - DISASSEMBLY AND ASSEMBLY 11-3-49

This task covers: A. DISASSEMBLY B. CLEANING C. INSPECTION D. ASSEMBLY

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Crowfoot Attachment 1-5/16, 3/8 Drive	5120-00-184-8409
Wrench, Torque, 1/2 Drive	5120-00-270-3121
Wrench, 1-1/4 & 1-5/16 Open-end (2)	5120-00-277-2321
Adapter, Torque, 1/2, 3/8 Drive	5120-00-867-5517

Materials/Parts:

(E29)	Lockwire

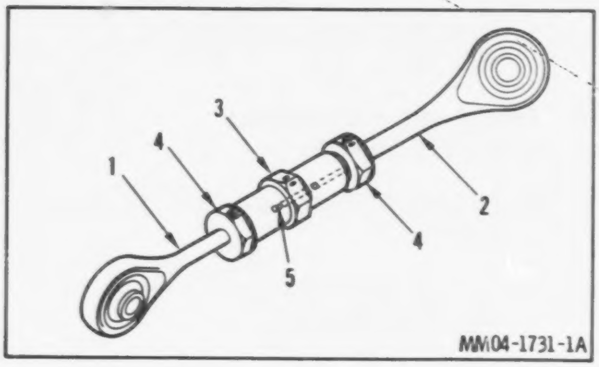
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

A. DISASSEMBLY

CAUTION

Rotating rod ends in opposite directions will damage the pitch link assembly. Rotate only the barrel during disassembly, assembly, or adjustment.



Remove rod ends (1) and (2) from barrel (3).

a. Remove lockwire.

b. Hold barrel (3). Use 1-5/16 open-end wrench.

c. Loosen two nuts (4). Use 1-5/16 open-end wrench.

d. Hold rod end (2) securely.

e. Rotate barrel (3) to free it from rod end (2).

f. Hold rod end (1) securely.

g. Rotate barrel (3) to free it from rod end (1).

h. Remove alinement pin (5) from barrel (3).

i. Remove two nuts (4) from rod ends (1) and (2).

GO TO NEXT PAGE

11-3-49. MAIN ROTOR PITCH LINK ASSEMBLY - DISASSEMBLY AND ASSEMBLY (cont) 11-3-49

B. **CLEANING**

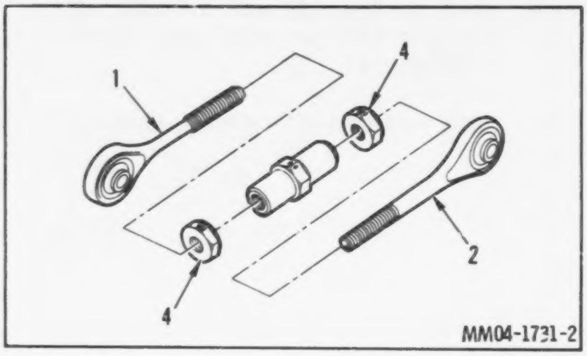
Wipe removed and attaching parts with a clean rag.

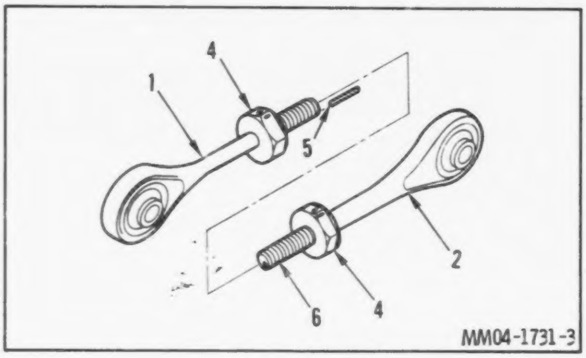
C. **INSPECTION**

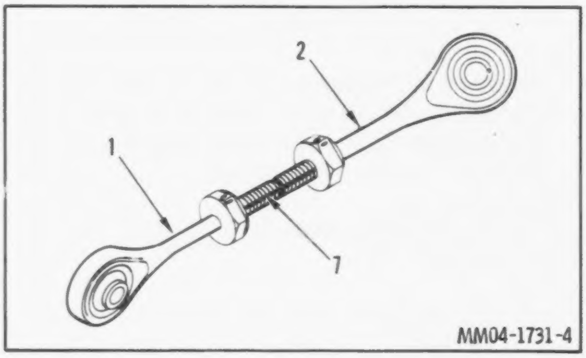
1. **Check parts for damage** (para 11-3-1).
2. **Check parts for corrosion** (para 1-5-38).

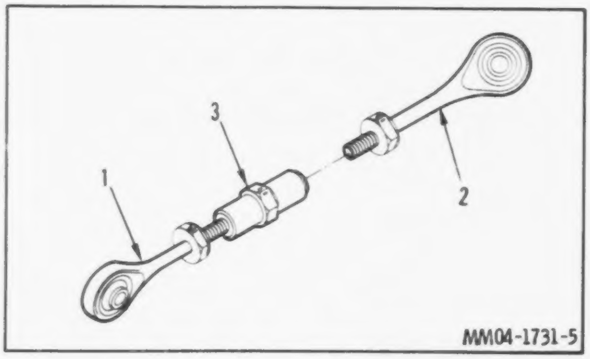
D. **ASSEMBLY**

1. **Prepare rod ends (1) and (2) for assembly.**
    a. Run nut (4) all the way up the threaded portions of both rod ends (1) and (2).
    b. Insert alinement pin (5) in alinement hole (6). Aline rod ends (1) and (2).
    c. Draw alinement line (7) length of threaded portion of rod ends (1) and (2).
    d. Separate rod end (1) from rod end (2).
2. **Install barrel (3) on rod ends (1) and (2).**
    a. Rotate barrel (3) two complete turns on rod end (1).









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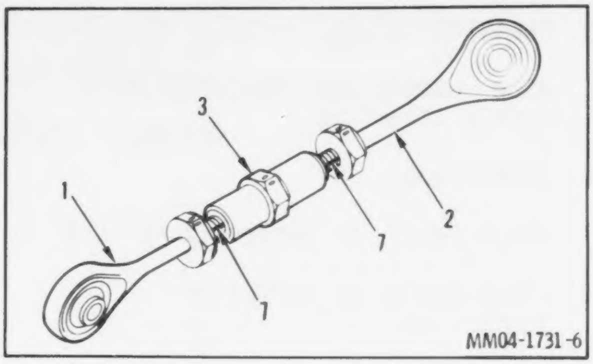
11-3-49. MAIN ROTOR PITCH LINK - DISASSEMBLY AND ASSEMBLY (cont) 11-3-49

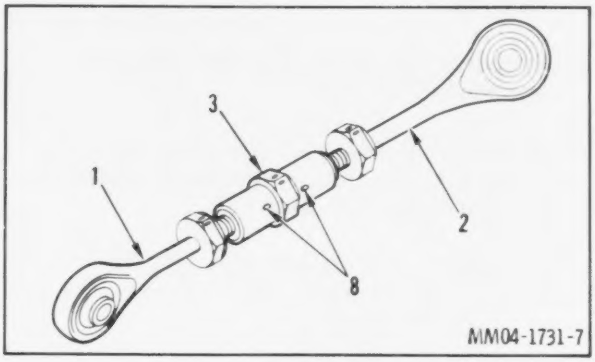
b. Hold barrel (3) while rotating rod end (2) two complete turns into barrel (3).

c. Mate rod end alinement lines (7).



d. Hold rod end (2) securely.

e. Rotate barrel (3) on rod ends (1) and (2) until ends of rod ends (1) and (2) can be seen in two bearing inspection holes (8).



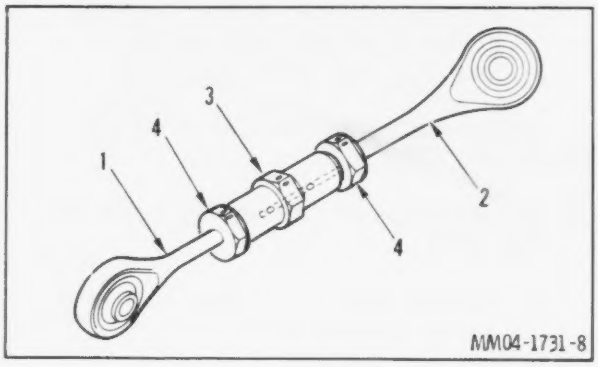
NOTE

Bearing alinement pin will be entering bearing assembly alinement hole when both rod-ends appear in barrel inspection holes.

f. If binding occurs, loosen barrel (3).

g. Rotate rod end (2) left or right in small increments to correct misalinement.

h. Continue rotating barrel (3) on rod ends (1) and (2) until barrel (3) reaches two nuts (4).



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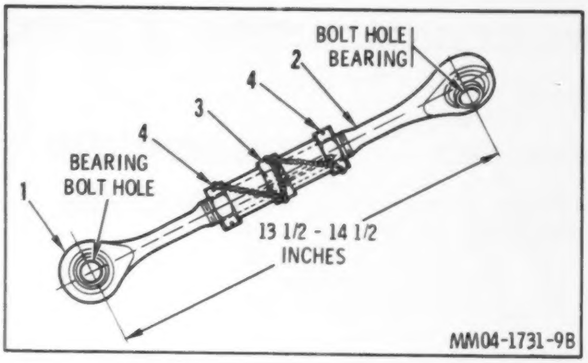

BOLT HOLE
BEARING
2
4
3
4
BEARING
BOLT HOLE
1
13 1/2 - 14 1/2
INCHES
MM04-1731-9B

3. **Adjust pitch link to 13-1/2 to 14-1/2 INCHES.**

   a. Measure distance from center-to-center of bearing bolt holes.

   b. Hold rod ends (1) and (2) securely.

   c. Rotate barrel (3) to bring link to correct length.

   d. Hold barrel (3). Use 1-5/16 open-end wrench.

4. **Torque two nuts (4) to 900 INCH-POUNDS.**

   a. Hold barrel (3).

   b. Torque two nuts (4) to **900 INCH-POUNDS.** Use torque wrench, 1/2, 3/8 drive adapter, and 1-5/16 crowfoot.

5. **Lockwire two nuts (4) to barrel (3) with lockwire (E29).**

6. **Inspect (TI).**

END OF TASK

11-3-50. PILOT OR CPG COLLECTIVE STICK REMOVAL 11-3-50

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

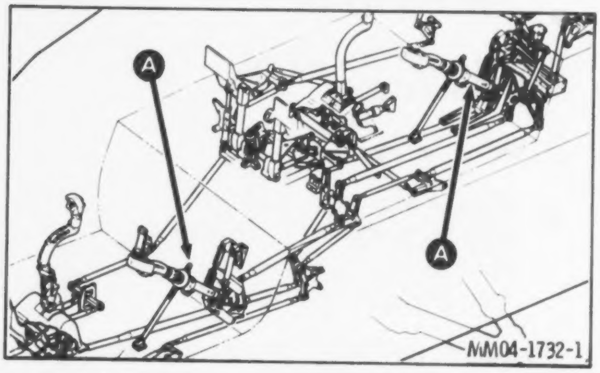
67R10 Attack Helicopter Repairer

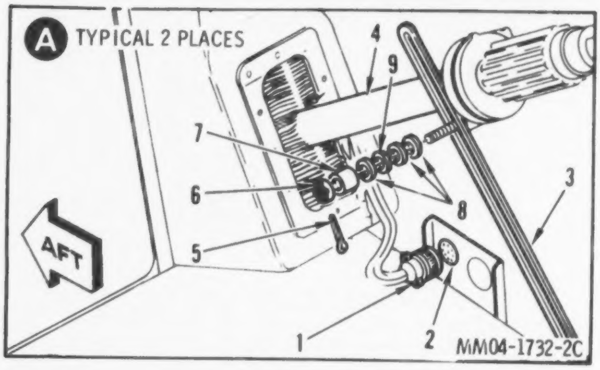
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

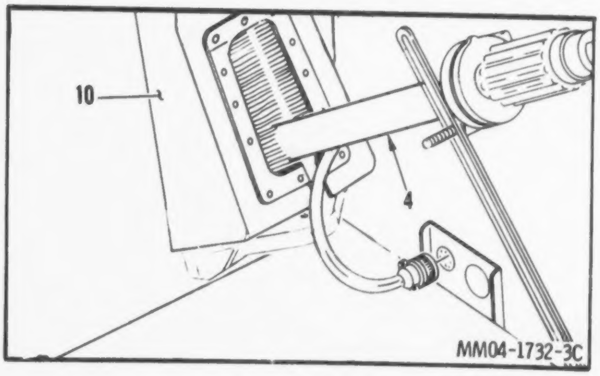
A. REMOVAL

1. **Enter pilot/or CPG station (para 1-7-1). Observe all safety precautions.**


A
A
MM04-1732-1


A TYPICAL 2 PLACES
4
9
7
6
5
8
3
AFT
1
2
MM04-1732-2C

2. **Detach connector P1 (pilot)/ P1 (CPG) (1) from connector J994 (pilot)/J993 (CPG) (2).**
3. **Disconnect guide (3) from collective stick (4).**
   a. Remove and discard cotter pin (5).
   b. Remove nut (6).
   c. Remove retainer (7), washers (8), and spacer washer (9).


10
4
MM04-1732-3C

4. **Remove boot (10) from stick (4)** (para 11-3-54).

GO TO NEXT PAGE

11-3-50. PILOT OR CPG COLLECTIVE STICK REMOVAL (cont) 11-3-50

5. **Remove stick (4) from arm (13).**

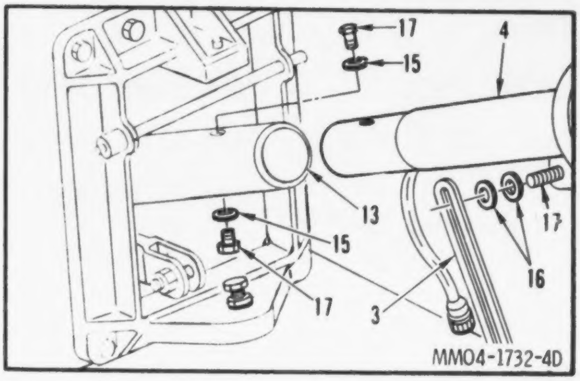
   a. Remove lockwire from two bolts (17).

   b. Remove two bolts (17) and two washers (15).

   c. Remove guide (3) from stick (4).

   d. Slide stick (4) out from arm (13).

   e. Remove two washers (16) from stick (4) guide stud (17).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check all parts removed for damage** (para 11-3-1).

2. **Check all parts removed for** corrosion (para 1-5-38).

END OF TASK

11-3-51. PILOT OR CPG COLLECTIVE STICK INSTALLATION 11-3-51

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Scale, Dial Indicating	6670-00-240-5821

Materials/Parts:

	Cotter Pin (2)
(E81)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

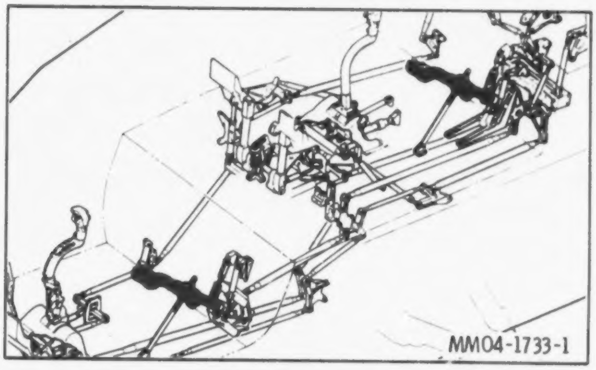
TM 55-1520-238-T

Equipment Conditions:

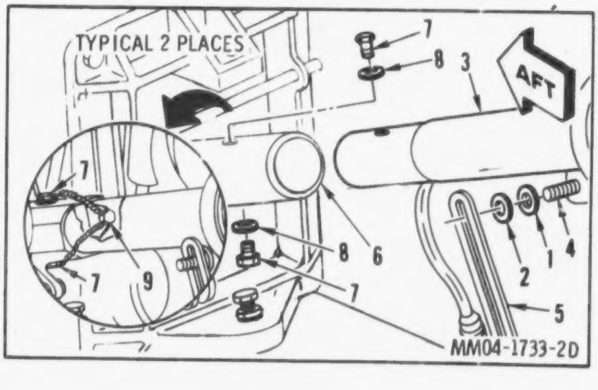
Ref	Condition
1-7-2	Helicopter safed
1-7-18	External hydraulic power connected to helicopter

NOTE

This task is typical for pilot and CPG collective sticks except as noted.



1. Position washer (1) and phenolic washer (2) on stick (3) guide stud (4).
2. Position stick (3) so that stud (4) engages guide (5), and stick (3) will enter arm (6).
3. Install stick (3) in arm (6). Install two washers (8) and two bolts (7).
4. Lockwire two bolts (7) to retainer (9). Use lockwire (E81).

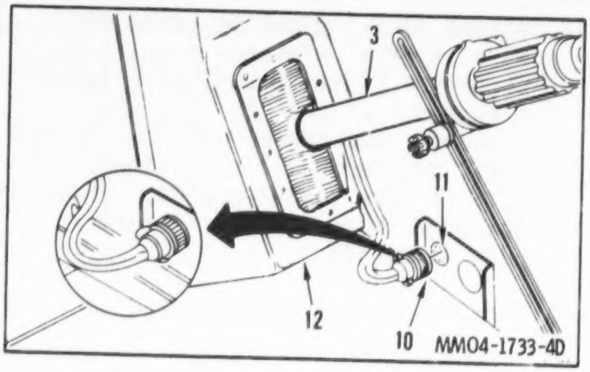


GO TO NEXT PAGE

11-3-51. PILOT OR CPG COLLECTIVE STICK INSTALLATION (cont) 11-3-51

5. **Attach connector P1 (pilot) P1 (CPG) (10) to connector J994 (pilot) J993 (CPG) (11).**

6. **Install boot (12) around collective stick (3) (para 11-3-54).**


3
11
12
10
MM04-1733-4D

7. **Connect collective stick (3) to guide (5).**

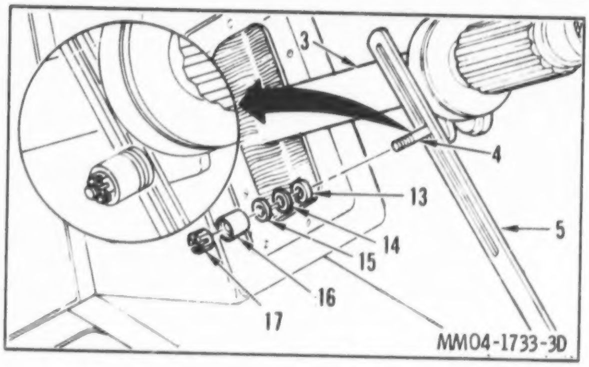
   a. Install phenolic washer (13), spacer washers (14) (as required), teflon washer (15), and retainer (16) on stud (4).

   NOTE

   Be sure to install retainer with flat side facing washers.

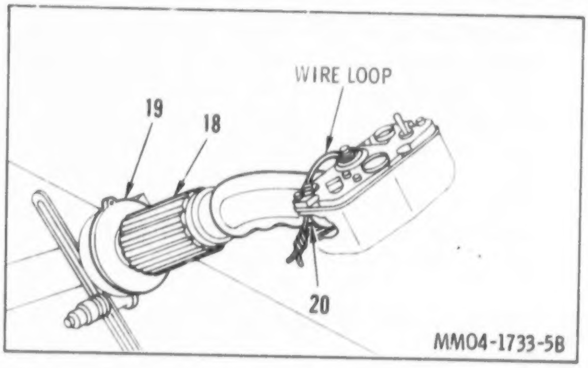
   b. Install nut (17) on guide stud (4) firmly against retainer (16). Do not compress retainer spring.

   c. Aline cotter pin holes but do not install new cotter pin.


3
4
13
5
14
15
16
17
MM04-1733-3D

8. **Turn grip handle (18) on pilot and CPG collective sticks to zero degrees on dial (19).**

9. **Make wire loop at grip reference point (20) for attaching scale when making friction adjustments.**

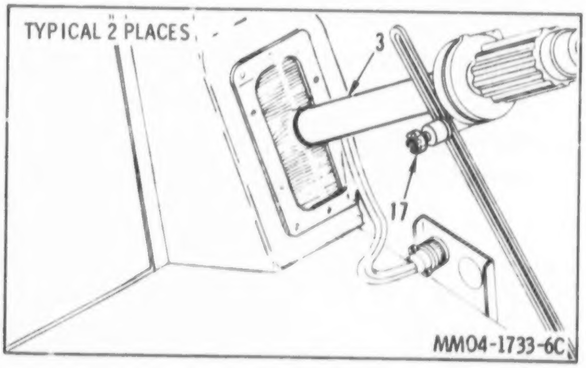

WIRE LOOP
19
18
20
MM04-1733-5B

10. **Apply external hydraulic power (para 1-7-18).**

11. **When adjusting friction range on CPG collective stick, loosen nut (17) on pilot collective stick (3).**

NOTE

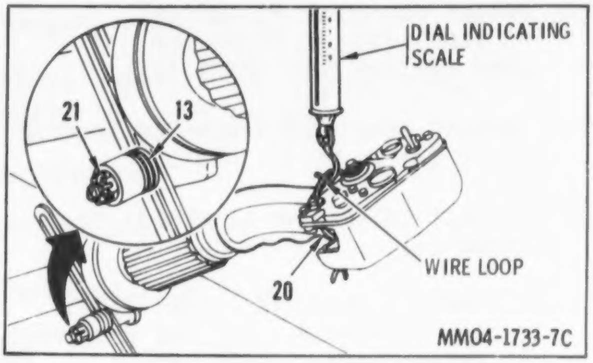
Be sure to adjust CPG collective stick before adjusting pilot collective stick.


TYPICAL 2 PLACES
3
17
MM04-1733-6C

GO TO NEXT PAGE

11-3-51. PILOT OR CPG COLLECTIVE STICK INSTALLATION (cont) 11-3-51

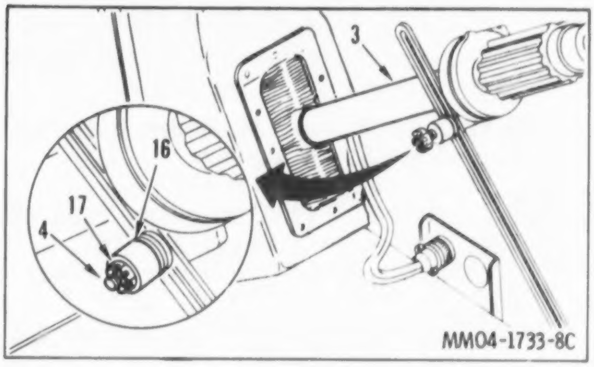
12. **Attach dial-indicating scale to wire at grip reference point (20). Check for friction pull of 2 to 4 pounds.** If pull is less than 2 pounds, add spacer washers (13) until desired pull is obtained. If pull is more than 4 pounds, remove spacer washers (13) until desired pull is obtained.



MM04-1733-7C

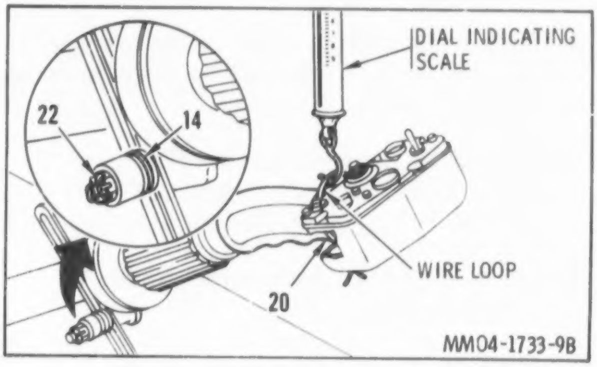
13. **Install new cotter pin (21).**

14. **Adjust friction range on pilot collective stick (3).**
    a. Tighten nut (17) on guide stand (4) firmly against retainer (16). Do not compress retainer spring.
    b. Aline cotter pin holes but do not install new cotter pin.



MM04-1733-8C

15. **Attach dial-indicating scale at grip reference point (20) and check for friction pull of 4 to 8 pounds.** If pull is less than 4 pounds, add spacer washers (14) until desired pull is obtained. If pull is more than 8 pounds, remove spacer washers (14) until desired pull is obtained.



MM04-1733-9B

16. **Install new cotter pin (22).**

17. **Inspect (TI).**

18. **Remove external hydraulic power unit** (para 1-7-18).

19. **Perform flight control system operational check** (TM 55-1520-238-T).

END OF TASK

11-3-52. FRICTION GUIDE REMOVAL 11-3-52

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

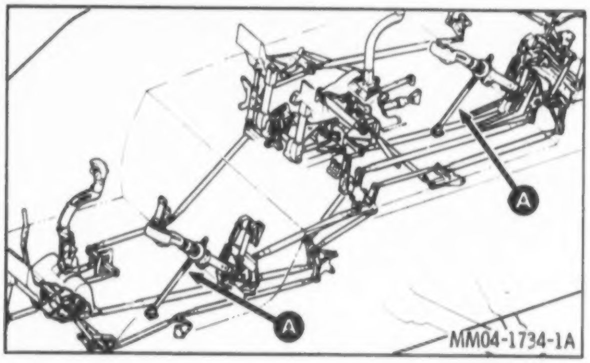
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

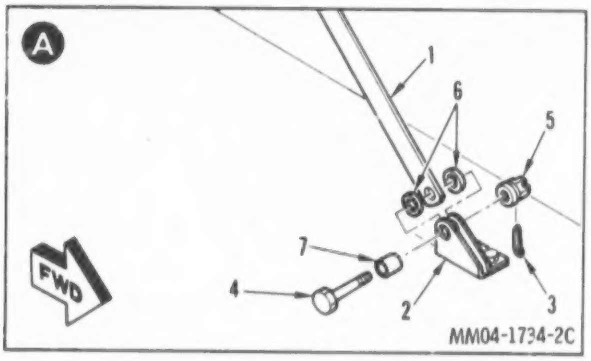
Personnel Required:

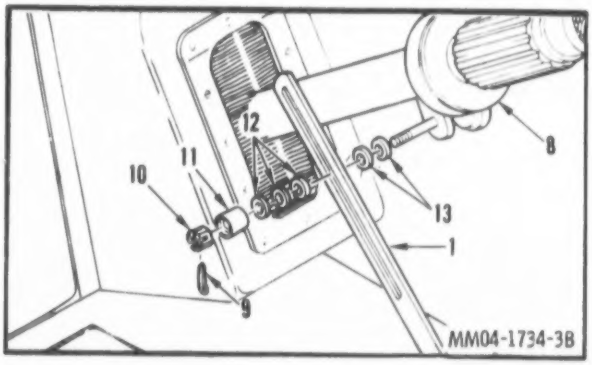
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed







A. REMOVAL

1. **Enter pilot or CPG station (para 1-7-1). Observe all safety precautions.**

2. **Disconnect guide (1) from base (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), two washers (6), bushing (7), and guide (1) from base (2).

3. **Disconnect guide (1) from housing (8).**

   a. Remove and discard cotter pin (9).

   b. Remove nut (10), retainer (11), and washers (12).

   c. Remove guide (1) from housing (8).

   d. Remove two washers (13) from housing (8).

GO TO NEXT PAGE

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check friction guide and collective stick for damage (para 11-3-1).
2. Check friction guide and collective stick for corrosion (para 1-5-38).

END OF TASK

11-3-53. FRICTION GUIDE INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)
(E34) Lockwire

Personnel Required:

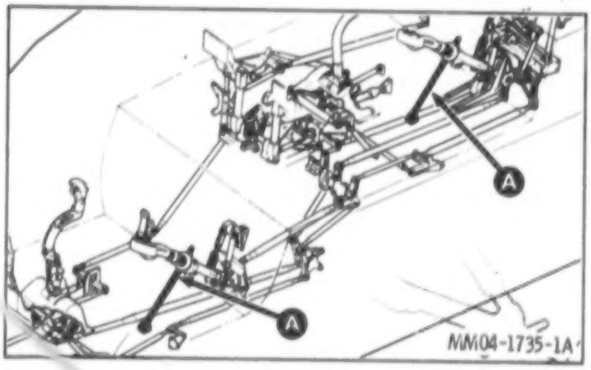
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

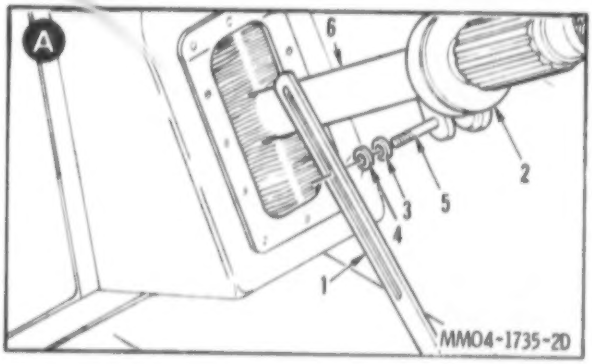
Ref	Condition
1-7-2	Helicopter safed
1-7-18	External hydraulic power connected to helicopter

NOTE

This task is typical for pilot or CPG collective sticks except as indicated.



1. **Enter pilot or CPG station (para 1-7-1). Observe all safety precautions.**
2. **Position guide (1) on housing (2).**
   a. Position washer (3) and phenolic washer (4) on stud (5).
   b. Position guide (1) on collective stick (6) stud (5).



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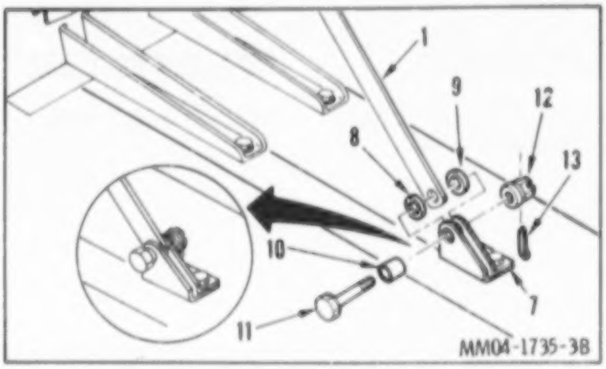
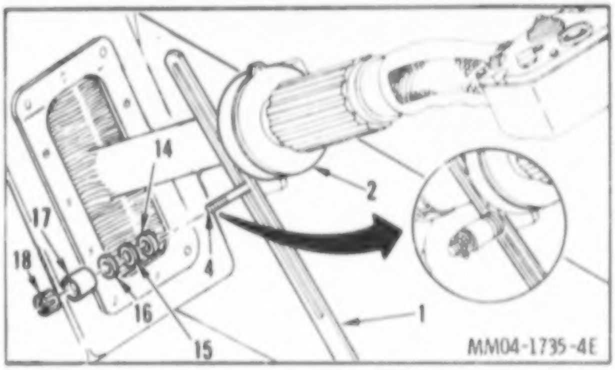
11-3-53. FRICTION GUIDE INSTALLATION (cont) 11-3-53

3. **Connect guide (1) to base (7).**
    a. Aline guide (1) with base (7).
    b. Position washers (8) and (9) between guide (1) and base (7).
    c. Install bushing (10) in base (7).
    d. Insert bolt (11) through bushing (10), washer (8), washer (9), guide (1) and base (7).
    e. Hold bolt (11). Install nut (12).
    f. Install new cotter pin (13).


1
9
12
8
13
10
7
11
MM04-1735-3B

4. **Install guide (1) on housing (2).**
    a. Install phenolic washer (14), spacer washers (15) (as required), teflon washer (16), and retainer (17) on stud (4).
    b. Install nut (18). Do not compress retainer spring.
    c. Aline cotter pin holes but do not install new cotter pin.


14
2
17
18
4
16
1
15
MM04-1735-4E

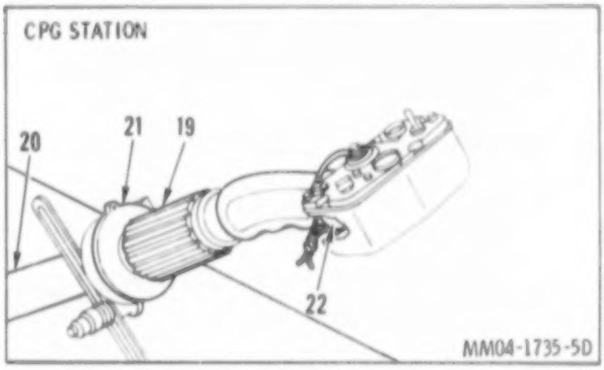
NOTE

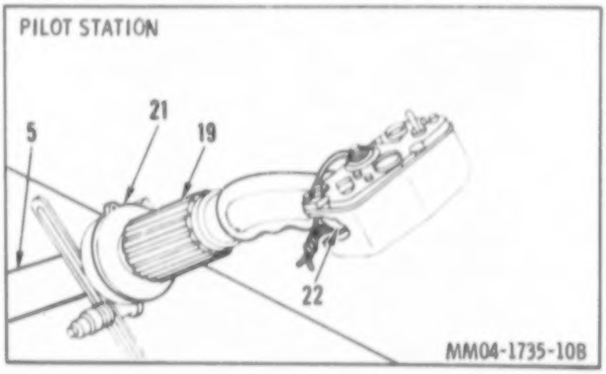
Be sure to install retainer (17) with flat side facing washers.

5. **Turn grip handle (19) on pilot (20) and CPG collective stick (5) to zero degrees on dial (21).**

6. **Put wire loop (E34) at grip reference point (22) for attaching scale when making friction adjustments.**

7. **Apply external hydraulic power** (para 1-7-18).


CPG STATION
20
21
19
22
MM04-1735-5D


PILOT STATION
21
5
19
22
MM04-1735-10B

GO TO NEXT PAGE

11-3-53. FRICTION GUIDE INSTALLATION (cont) 11-3-53

8. **When adjusting friction range on CPG collective stick (5), loosen nut (18) on pilot collective stick (20).**

NOTE

Be sure to adjust CPG collective stick before adjusting pilot collective stick.

9. **Attach dial indicating scale to wire (E34) at grip reference point (22) check for friction pull of 2 to 4 pounds.** If pull is less than 2 pounds, add spacer washers (15) until desired pull is obtained. If pull is more than 4 pounds, remove spacer washers (15) until desired pull is obtained.

10. **Install new cotter pin (23) in collective stick (5).**

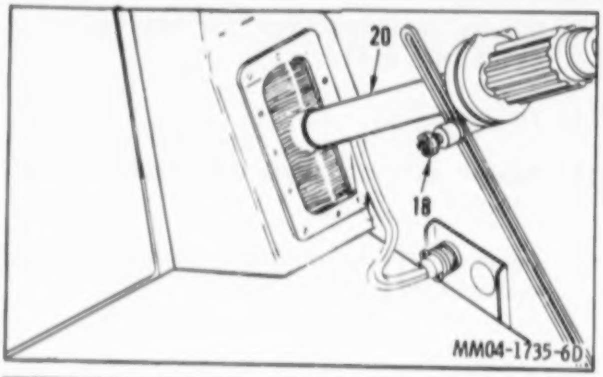
11. **Adjust friction range on pilot collective stick (20).**

    a. Tighten nut (18) on guide stud (4) firmly against retainer (17). Do not compress retainer spring.

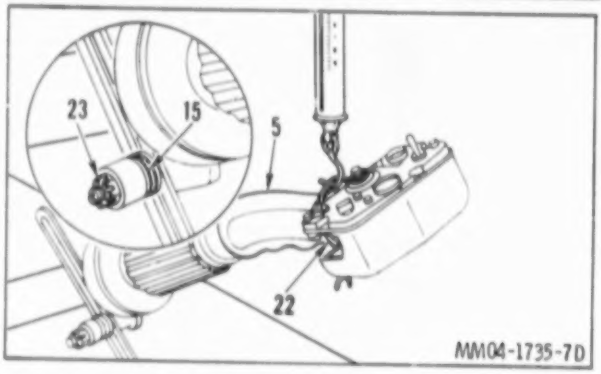
    b. Aline cotter pin holes but do not install new cotter pin.

12. **Attach dial indicating scale at grip reference point (22) and check for friction pull of 4 to 8 pounds.** If pull is less than 4 pounds, add spacer washers (15) until desired pull is obtained. If pull is more than 8 pounds, remove spacer washers (15) until desired pull is obtained.

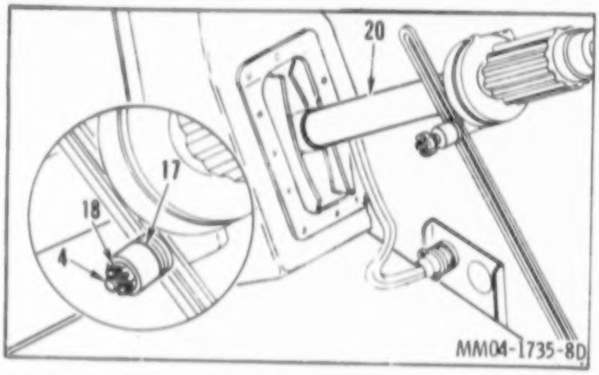
13. **Install new cotter pin (23).**



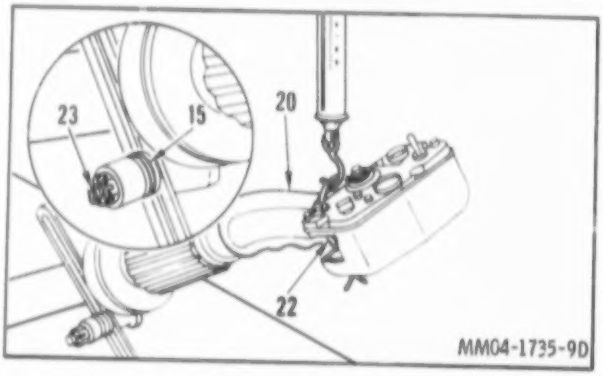
MM04-1735-6D



MM04-1735-7D



MM04-1735-8D



MM04-1735-9D

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11-3-53. FRICTION GUIDE INSTALLATION (cont) 11-3-53

14. Remove lockwire from collective stick and dial.

15. Inspect (TI).

16. Remove external hydraulic power unit (para 1-7-18).

17. Perform flight control system operational check (TM 55-1520-238-T).

END OF TASK

11-3-54. COLLECTIVE STICK COVER REMOVAL/INSTALLATION 11-3-54

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1500-204-25/1

Equipment Conditions:

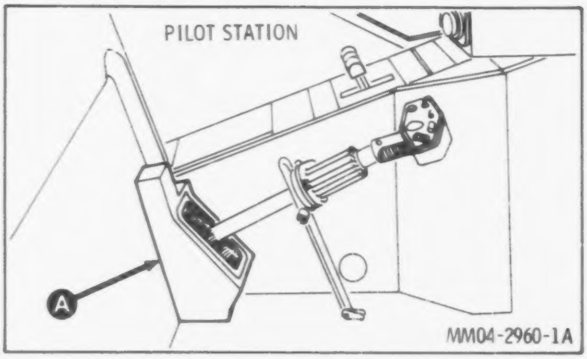
Ref	Condition
1-7-2	Helicopter safed

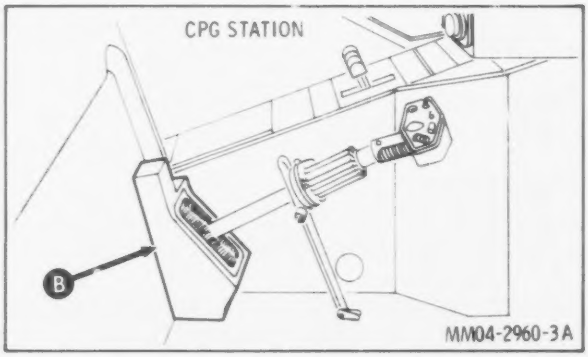
NOTE

This task is typical for either pilot or CPG collective stick covers.

A. **REMOVAL**

1. **Enter pilot/CPG station** (para 1-7-1). **Observe all safety precautions.**





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11-3-54. COLLECTIVE STICK COVER REMOVAL/INSTALLATION (cont) 11-3-54

2. **Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**

3. **In pilot station, detach connector J230 (1) from connector P230 (2).**

4. **In CPG station, detach connector J234 (1) from connector P234 (2).**

5. **Remove collective stick cover (3).**

   a. Remove seven screws (4) and washers (5) from pilot cover. Remove six screws (4) and washers (5) from CPG cover.

   b. Remove grommet (6) and cable (7) from cover (3).

   c. Detach potentiometer cable connector P1121 (11) from N_R droop compensator connector A656J1 (12).

   d. Remove cover (3) from collective stick (8).

B. **CLEANING**

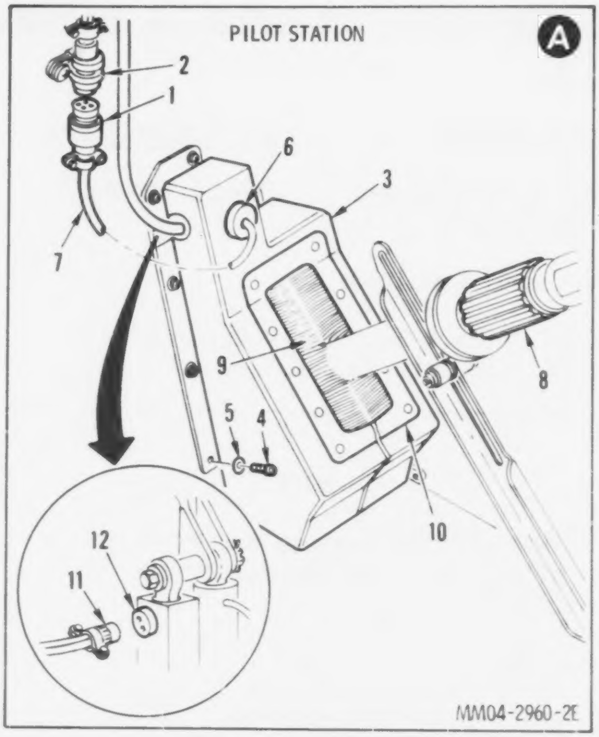
Wipe removed and attaching parts with a clean rag.

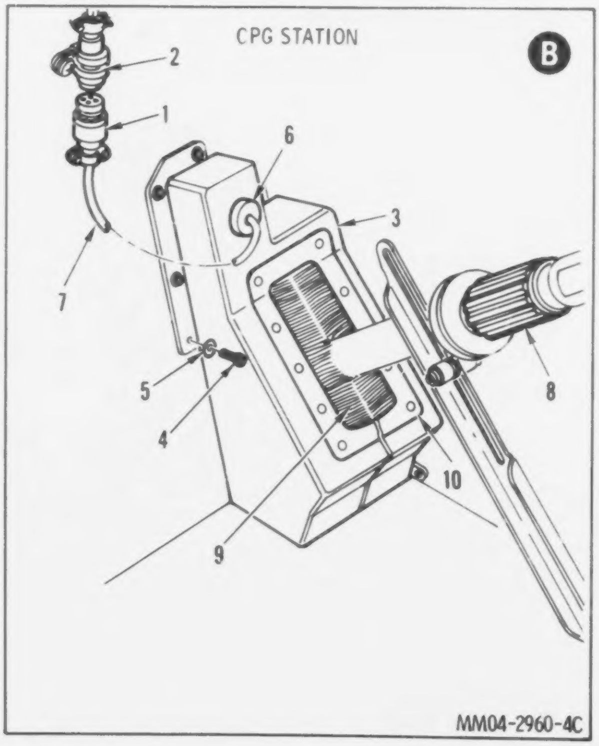
C. **INSPECTION**

1. **Check for missing grommet or screws.**

2. **Check retainer for loose or missing rivets** (TM 55-1500-204-25/1).

3. **Check collective stick cover assembly for wear or cracks.**





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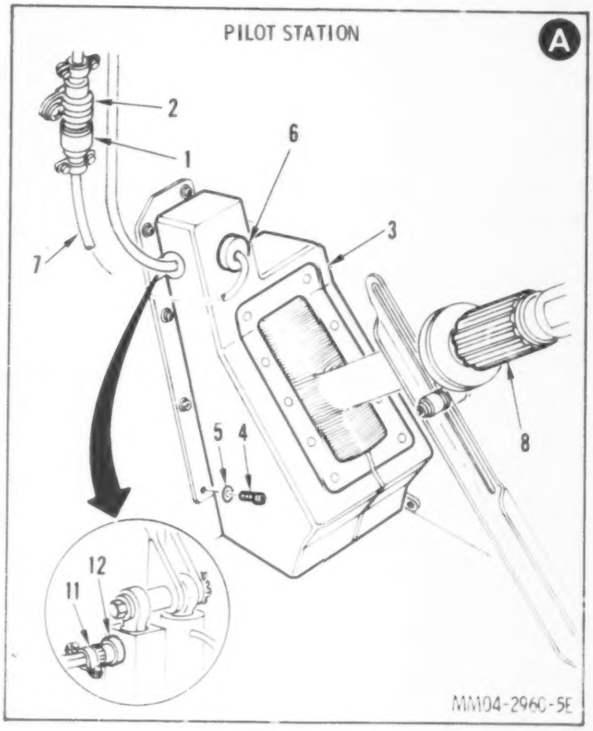
11-3-54. COLLECTIVE STICK COVER REMOVAL/INSTALLATION (cont) 11-3-54

D. INSTALLATION

1. **Install collective stick cover assembly (3) on collective stick (8).**
   - a. Position LVDT cable (7) in grommet (6).
   - b. Install grommet (6) in cover (3).
   - c. Attach potentiometer cable connector P1121 (11) to N_R droop compensator connector A656J1 (12).
   - d. Position cover (3) on collective stick (8) and aline mounting holes.
   - e. Install seven washers (5) and seven screws (4) for pilot cover, install six washers (5) and six screws (4) for CPG cover.
2. **In pilot station, attach connector J230 (1) to connector P230 (2).**
3. **In CPG station, attach connector J234 (1) to connector P234 (2).**
4. **Inspect (TI).**


PILOT STATION
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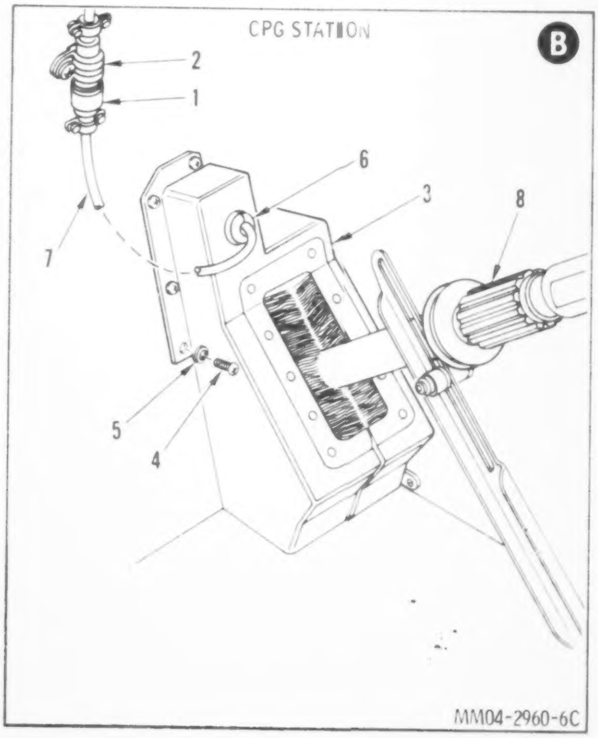
CPG STATION
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MM04-2960-6C

END OF TASK

11-3-55. CPG COLLECTIVE STICK SPRING REMOVAL 11-3-55

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

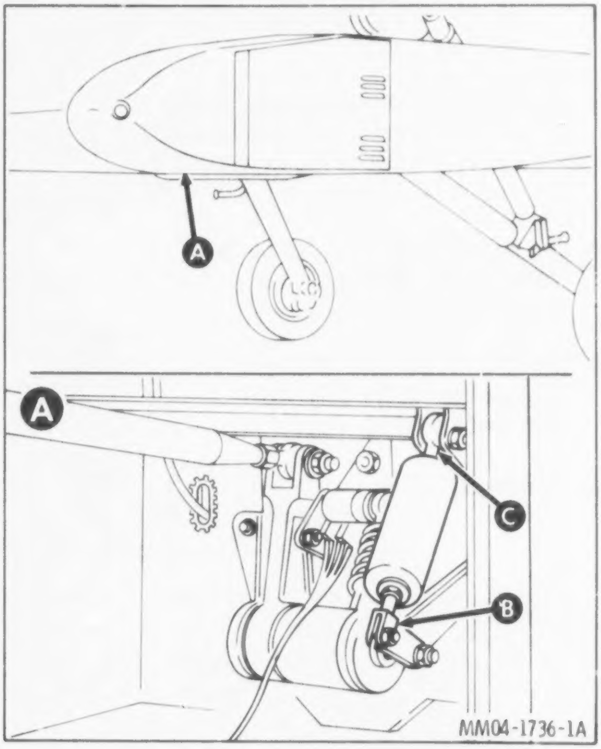
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	Gun turret removed



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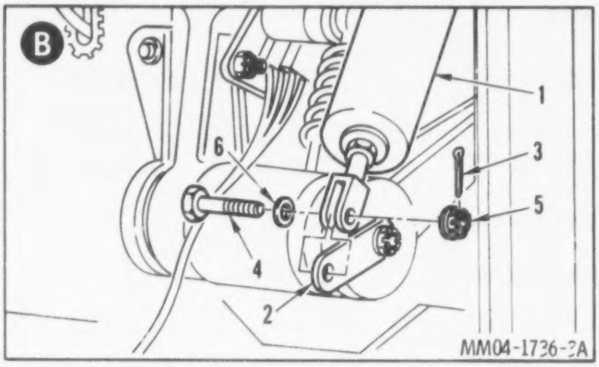
11-3-55. CPG COLLECTIVE STICK SPRING REMOVAL (cont) 11-3-55

A. REMOVAL

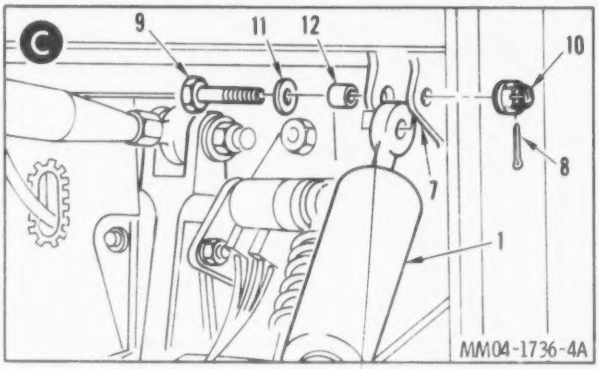
1. Disconnect spring (1) from arm (2).

- a. Remove and discard cotter pin (3).
- b. Hold bolt (4). Remove nut (5).
- c. Remove bolt (4) and washer (6).



2. Remove spring (1) from bracket (7).

- a. Remove and discard cotter pin (8).
- b. Hold bolt (9). Remove nut (10).
- c. Remove bolt (9), washer (11), and bushing (12).



B. CLEANING

Wipe removed and attaching parts, with a clean rag.

C. INSPECTION

1. **Check all parts removed and attaching parts for damage** (para 11-3-1).
2. **Check all removed parts and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-3-56. CPG COLLECTIVE STICK SPRING INSTALLATION 11-3-56

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

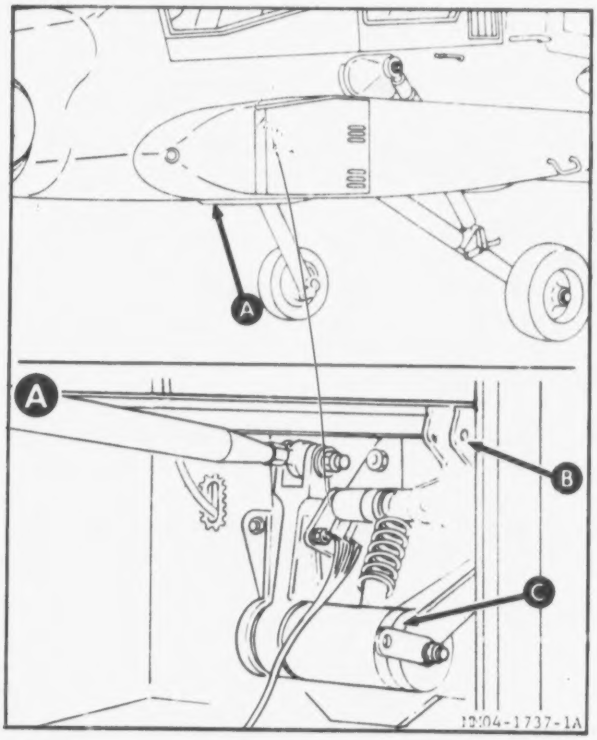
Cotter Pin (2)

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	Gun turret removed



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11-3-56. CPG COLLECTIVE STICK SPRING INSTALLATION (cont) 11-3-56

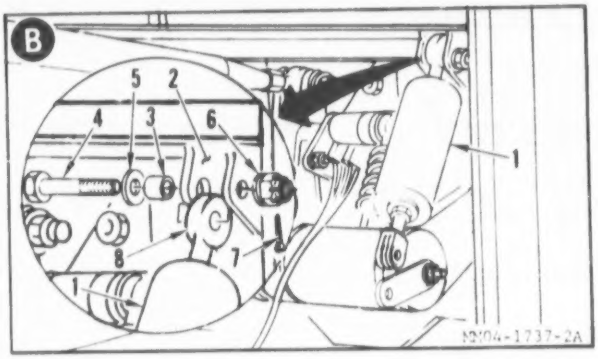
1. **Connect spring (1) to bracket (2).**

   a. Aline spring (1) with bracket (2).

   b. Install bushing (3), washer (5), and bolt (4).

   c. Hold bolt (4) and install nut (6).

   d. Install new cotter pin (7).



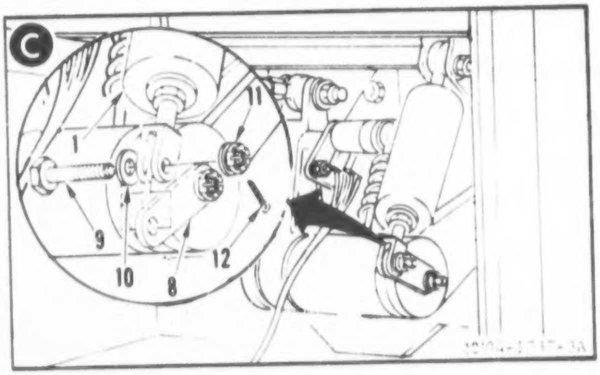
2. **Connect spring (1) to arm (8).**

   a. Aline spring (1) with arm (8).

   b. Insert bolt (9) through washer (10), spring (1), and arm (8).

   c. Hold bolt (9). Install nut (11).

   d. Install new cotter pin (12).



3. **Inspect (TI).**

4. **Install gun turret** (TM 9-1090-208-23).

END OF TASK

11-3-57. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT 11-3-57

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Shear Pin
(E34)	Lockwire
(E16)	Petrolatum

Personnel Required:

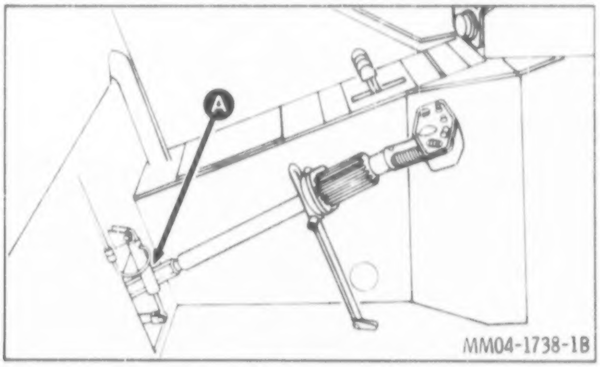
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

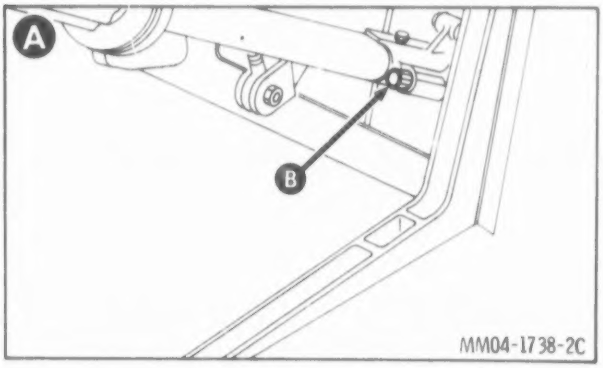
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-54	CPG collective stick cover removed





A. REMOVAL

1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

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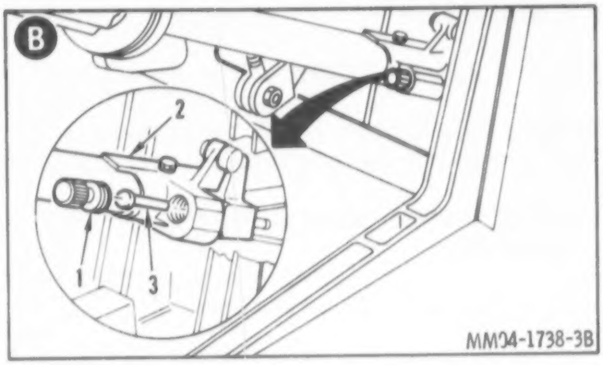
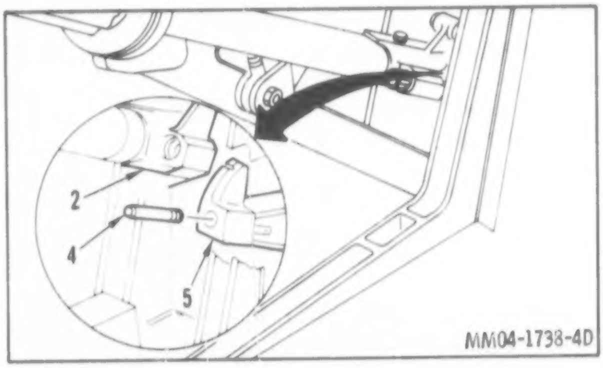
11-3-57. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT (cont) 11-3-57





2. **Remove shear pin retainer (1) from arm (2).**

   a. Remove lockwire.

   b. Unscrew retainer (1).

NOTE

Remove shear pin in pieces if sheared.

3. **Remove shear pin half (3) from arm (2).**

4. **Remove shear pin half (4) from lever (5).**

   a. Move arm (2) to allow access to shear pin half (4).

   b. Remove shear pin half (4) from lever (5).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check SPAD for damage** (para 11-3-1).

2. **Check retainer and SPAD for corrosion** (para 1-5-38).

3. **Check retainer for damaged threads.** None allowed.

GO TO NEXT PAGE

11-3-57. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT (cont) 11-3-57

D. INSTALLATION

NOTE

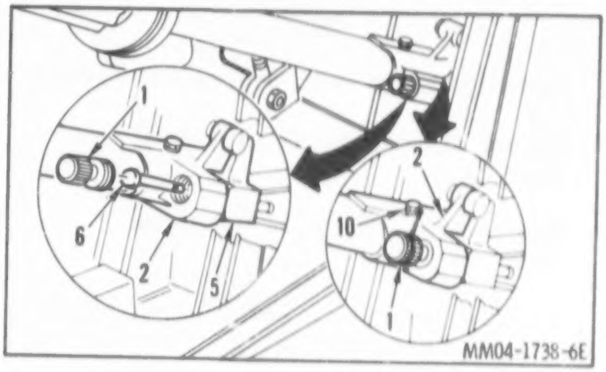
Apply petrolatum (E16) to tapered end of shear pin before installation.

1. **Install shear pin (6) in arm (2) and lever (5).**

   a. Aline arm (2) with lever (5).

   b. Ensure that switch detent (8) and switch position lever (9) are engaged.

   c. Insert shear pin (6) through arm (2) and lever (5).



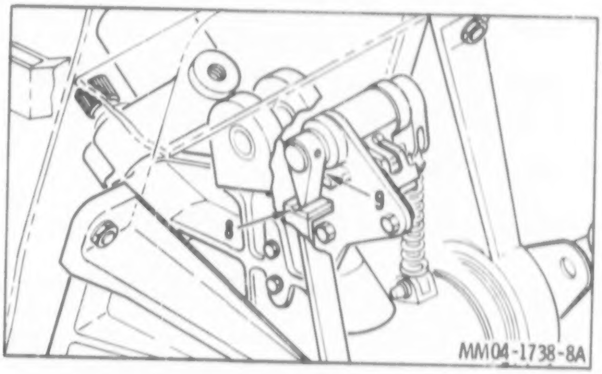
NOTE

Install retainer only fingertight.

2. **Install retainer (1) on arm (2).** Lockwire retainer (1) to bolt (10). Use lockwire (E34).

3. **Inspect (TI).**

4. **Install CPG collective stick cover** (para 11-3-54).



END OF TASK

11-3-58. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT 11-3-58

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Shear Pin
(E16)	Petrolatum
(E29)	Lockwire

Personnel Required:

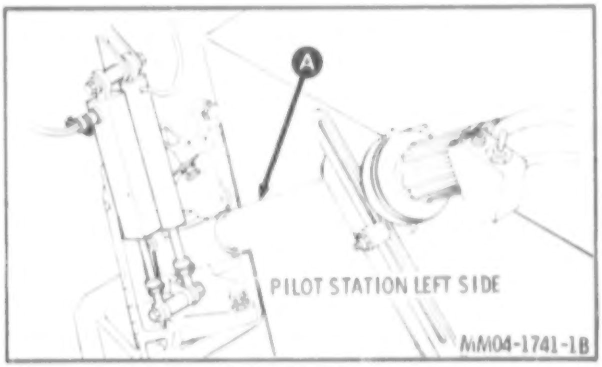
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

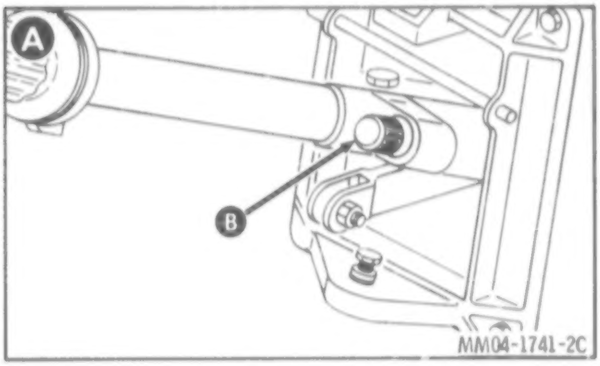
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-54	Pilot collective stick cover removed





A. REMOVAL

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**

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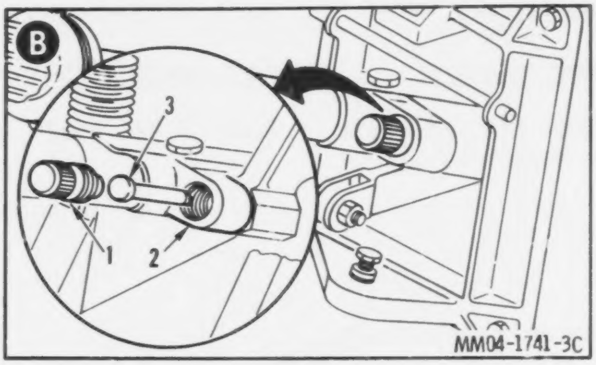
11-3-58. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT (cont) 11-3-58



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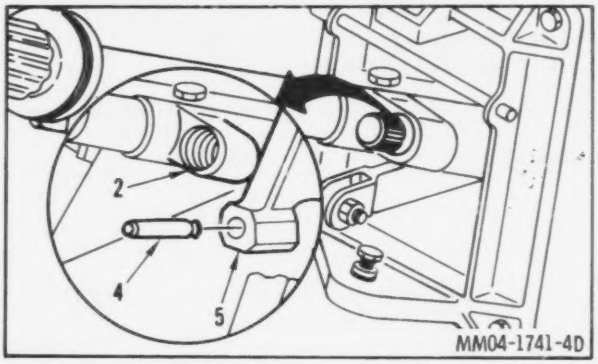


MM04-1741-4D

2. **Remove shear pin retainer (1) from arm (2).**
   a. Remove lockwire.
   b. Unscrew retainer (1).

NOTE

Remove shear pin in pieces if sheared.

3. **Remove shear pin half (3) from arm (2).**
4. **Remove shear pin half (4) from lever (5).**
   a. Move arm (2) to allow access to shear pin half (4).
   b. Remove shear pin half (4) from lever (5).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

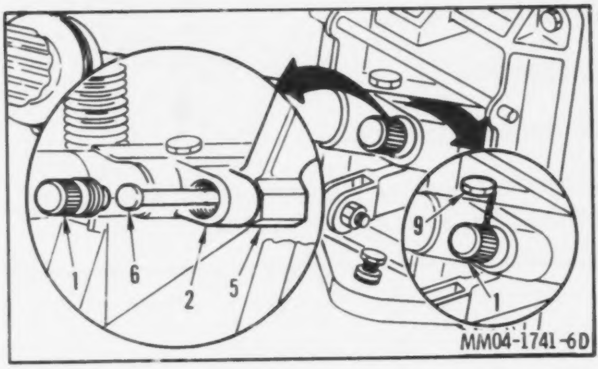
1. **Check SPAD for damage** (para 11-3-1).
2. **Check retainer and SPAD for corrosion** (para 1-5-38).
3. **Check retainer for damaged threads.** None allowed.

GO TO NEXT PAGE

11-3-58. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT (cont) 11-3-58

D. INSTALLATION

1. **Apply petrolatum (E16) to tapered end of shear pin (6).**

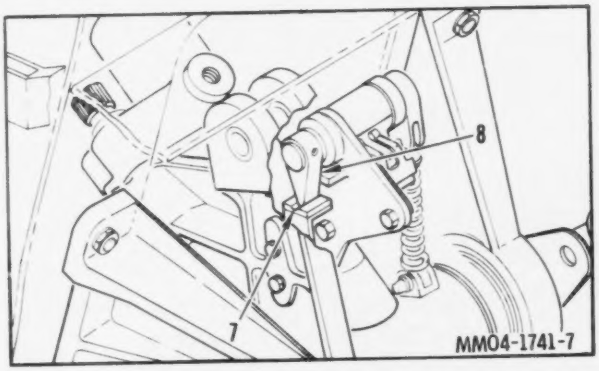


2. **Install shear pin (6) in arm (2) and lever (5).**
   a. Aline arm (2) with lever (5).
   b. Ensure that switch detent (7) and switch position lever (8) are engaged.
   c. Insert shear pin (6) through arm (2) and lever (5).

NOTE

Install retainer only fingertight.

3. **Install retainer (1) on arm (2).** Lockwire retainer (1) to bolt (9). Use lockwire (E29).
4. **Inspect (TI).**
5. **Install pilot collective stick** cover (para 11-3-54).



END OF TASK

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11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION 11-3-59

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. REPAIR E. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489
Rigging Kit, Flight Controls	1730-01-240-1577

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel R200 removed
11-3-27	Pilot cyclic stick cover removed
1-7-18	External primary hydraulic power removed
2-3-12	Pilot seat removed

GO TO NEXT PAGE

11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION (cont) 11-3-59

A. REMOVAL

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

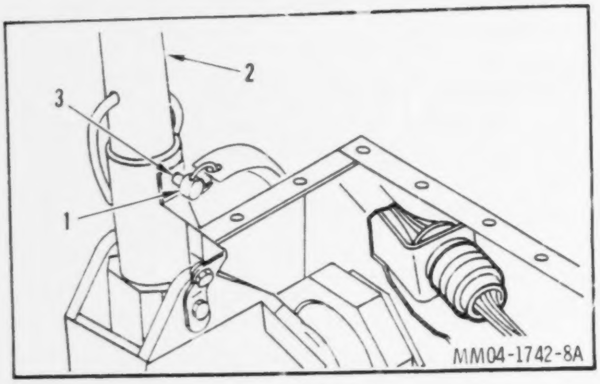
1. **Install -5 rig pin (1) in pilot cyclic stick (2).**

   Use control systems rigging kit.

   a. Enter pilot station (para 1-7-1). **Observe all safety precautions.**

   b. Slowly position stick (2) to aline rig pin holes (3).

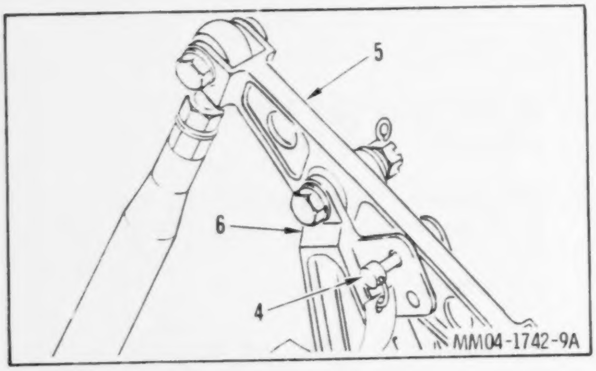
   c. Install -5 rig pin (1) in stick (2).



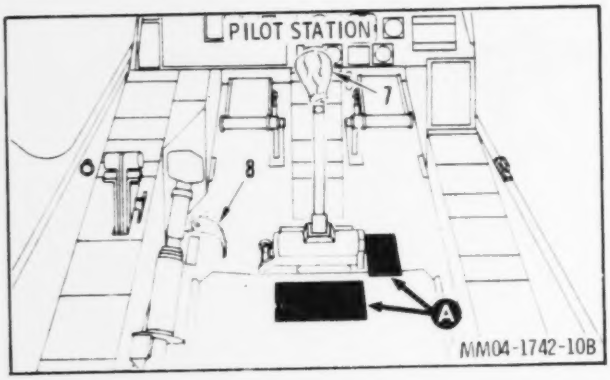
2. **Install -9 rig pin (4) in longitudinal FS 165 bellcrank (5) and bracket (6).** Use control systems rigging kit.

   a. Locate bellcrank (5) and bracket (6) on main deck.

   b. If rig pin hole in bellcrank (5) is not alined with mid-stroke hole in bracket (6), perform longitudinal flight control system rigging (para 11-6-8). If holes are alined, install -9 rig pin (4) through bracket (6) and bellcrank (5).



3. **Install cyclic stick cover (7), and collective stick warning flag (8).**



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11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION (cont) 11-3-59

4. **Remove access door (9) from pilot floor (10).**

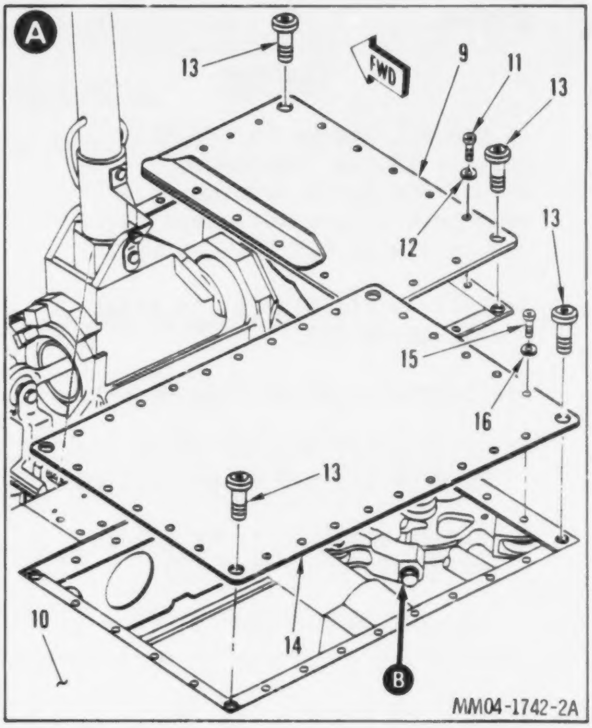
   a. Remove 16 screws (11), 16 washers (12), and 2 pins (13) from floor (10).

   b. Remove door (9).

5. **Remove access door (14) from pilot floor (10).**

   a. Remove 28 screws (15), 28 washers (16), and 4 pins (13) from floor (10).

   b. Remove door (14).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MM04-1742-2A

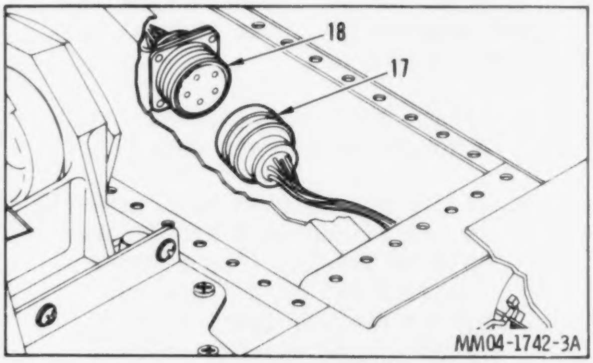
6. **Detach connector S35P1 (17) from connector J271 (18).**

7. **Disconnect longitudinal FS 130 push-pull rod (19) from (SPAD) (20).**

   a. Remove cotter pin (21).

   b. Hold bolt (22) and remove nut (23).

   c. Remove bolt (22), washer (24), bushing (25), and rod (19) from SPAD (20).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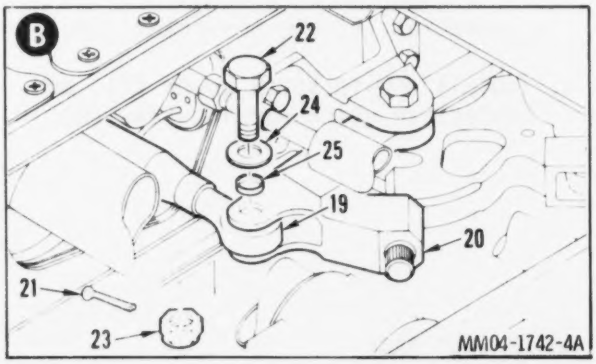
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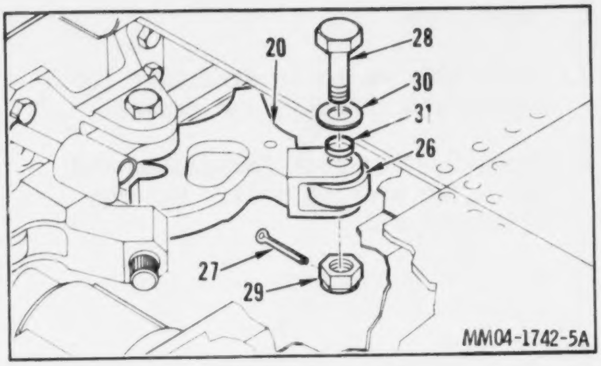
11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION (cont) 11-3-59



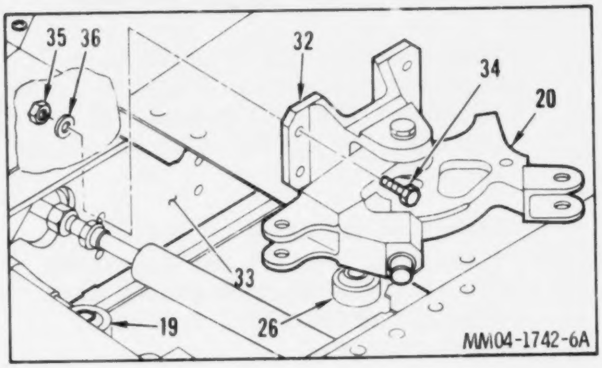
MM04-1742-5A

8. **Disconnect longitudinal FS 137 push-pull rod (26) from SPAD (20).**

   a. Remove and discard cotter pin (27).

   b. Hold bolt (28) and remove nut (29).

   c. Remove bolt (28), washer (30), bushing (31), and rod (26) from SPAD (20).



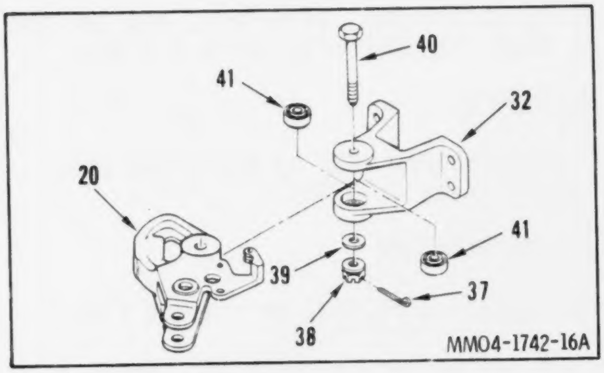
MM04-1742-6A

9. **Remove SPAD (20) and bracket (32) from structure (33).**

   a. Hold four bolts (34). Remove four nuts (35) and four washers (36).

   b. Support SPAD (20), and remove four bolts (34) from bracket (32).

   c. Remove SPAD (20) and bracket (32).



MM04-1742-16A

10. **Remove SPAD (20) from bracket (32).**

    a. Remove and discard cotter pin (37).

    b. Remove nut (38) and washer (39) from bolt (40).

    c. Remove bolt (40) and two bearings (41) from bracket (32) and SPAD (20).

    d. Remove SPAD (20) from bracket (32).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

GO TO NEXT PAGE

C. INSPECTION

1. **Check bolt holes in structure for elongation, cracks, and damage.**

2. **Check two rod ends for damage and excessive bearing play.** Maximum allowable play:

   Axial: **0.009-inch**
   Radial: **0.001-inch**

3. **Check bracket for damage and wear.**

   a. Damage within 1-1/2 times bolt mounting holes bore diameter is not to exceed 10% of the material thickness or **0.040-inch**, whichever is less.

   b. Damage in bulkhead or deck attachment area is not to exceed 25% of the item area and no more than 20% of material thickness after repair.

4. **Check bracket, structure, and two rod ends for corrosion** (para 1-5-38).

D. REPAIR

Repair SPAD (20) by replacing shear pin (para 11-3-60).

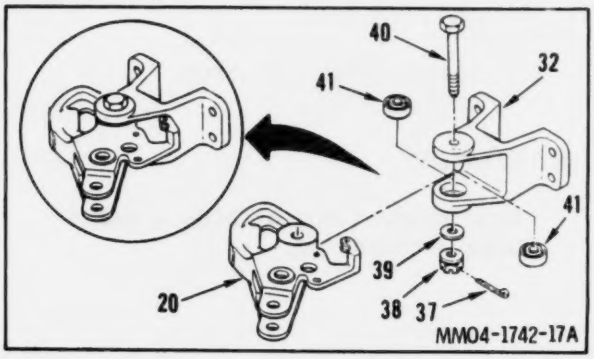
E. INSTALLATION

1. **Install SPAD (20) on bracket (32).**

   a. Aline two bearings (41) and SPAD (20) in bracket (32).

   b. Install bolt (40) through bracket (32) and two bearings (41).

   c. Install washer (39) and nut (38) on bolt (40).



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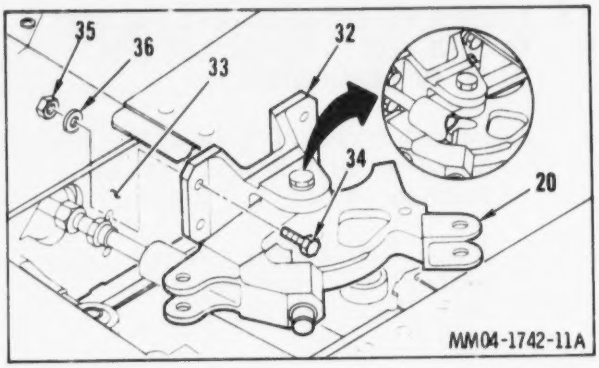
11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION (cont) 11-3-59

2. **Install SPAD (20) and bracket (32) on structure (33).**

   a. Position bracket (32) on structure (33) to aline four bolt holes.

   b. Install four bolts (34) through bracket (32) and structure (33).

   c. Hold four bolts (34). Install four washers (36) and four nuts (35).



3. **Connect FS 137 push-pull rod (26) to SPAD (20).** Torque nut (29) **30 TO 40 INCH-POUNDS.**

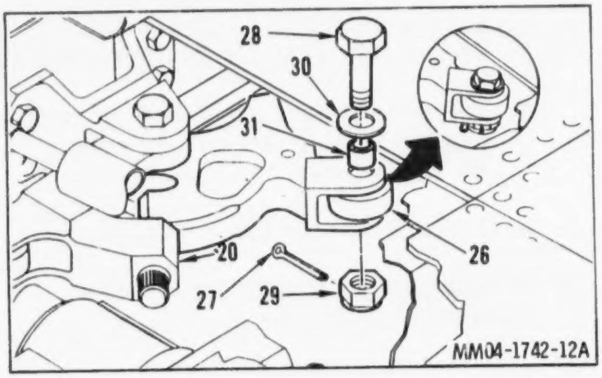
   a. Position rod (26) in SPAD (20) to aline bolt holes. Install bushing (31).

   b. Install bolt (28) through washer (30), bushing (31), SPAD (20), and rod (26) (para 11-2-3).

   c. Hold bolt (28). Install nut (29). Torque nut (29) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (27).



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11-3-59. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION (cont) 11-3-59

4. **Connect FS 130 push-pull rod (19) to SPAD (20).** Torque nut (23) **30 TO 40 INCH-POUNDS.**

   a. Position rod (19) in SPAD (20) to aline bolt holes. Install bushing (25).

   b. Install bolt (22) through washer (24), bushing (25), SPAD (20), and rod (19) (para 11-2-3).

   c. Hold bolt (22). Install nut (23). Torque nut (23) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (21).

5. **Attach connector S35P1 (17) to connector J271 (18).**

6. **Install access door (14) in pilot floor (10).** Install 28 washers (16), 28 screws (15), and 4 pins (13).

7. **Install access door (9) in pilot floor (10).** Install 16 washers (12), 16 screws (11), and 2 pins (13).

8. **Remove -5 rig pin (1) from stick (2).**

9. **Remove -9 rig pin (4) from longitudinal FS 165 bracket (6) and bellcrank (5).**

10. **Remove cyclic stick cover (7) and collective stick warning flag (8).**

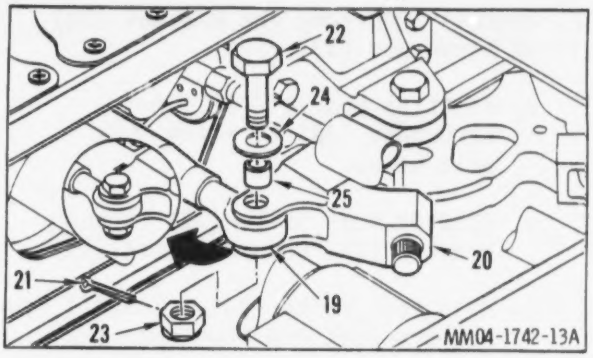
11. **Inspect (TI).**

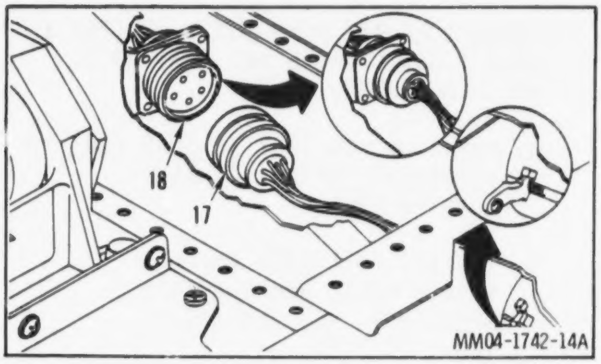
12. **Secure panel R200** (para 2-2-2).

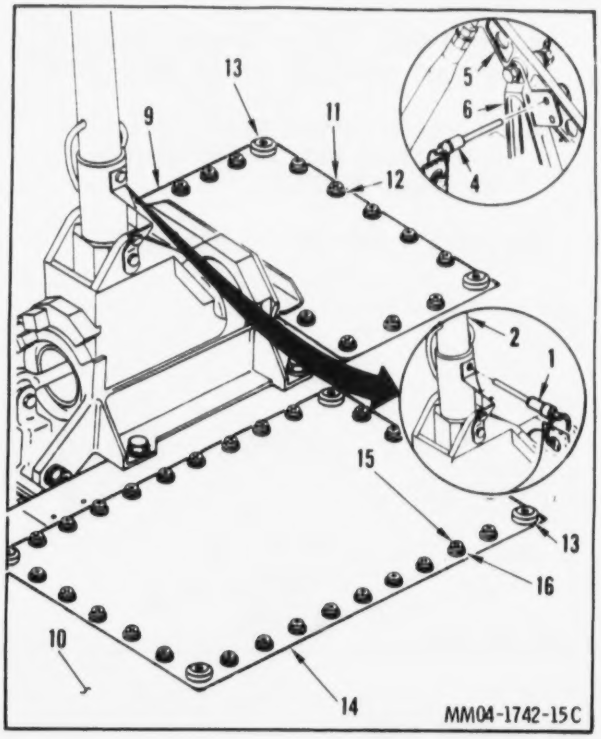
13. **Install pilot seat** (para 2-3-12).

14. **Install pilot cyclic cover** (para 11-3-28).

END OF TASK







11-3-60. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT 11-3-60

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin
	Shear Pin
(E16)	Petrolatum
(E29)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

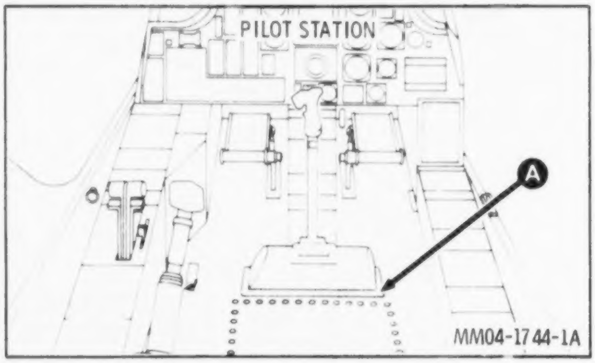
Equipment Conditions:

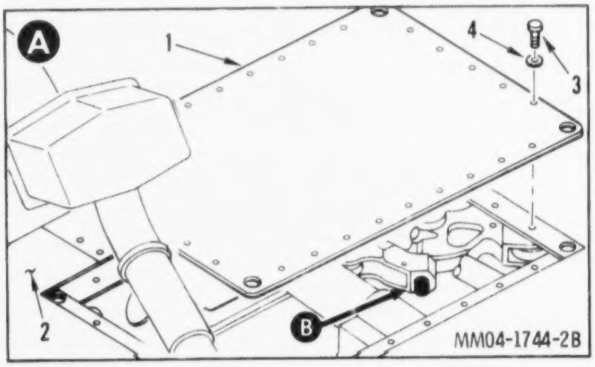
Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
2-3-12	Pilot seat removed

A. **REMOVAL**

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Remove panel (1) from pilot floor (2).** Remove 28 screws (3) and 28 washers (4).





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11-3-60. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-3-60

3. **Remove retainer (5) from lever (6).**

   a. Remove lockwire.

   b. Unscrew retainer (5).

NOTE

Remove shear pin in pieces if sheared.

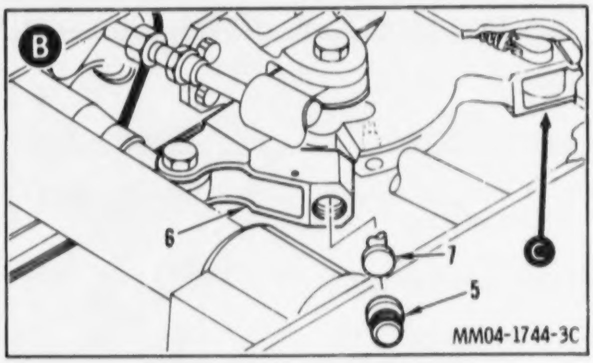
4. **Remove shear pin half (7) from lever (6).**

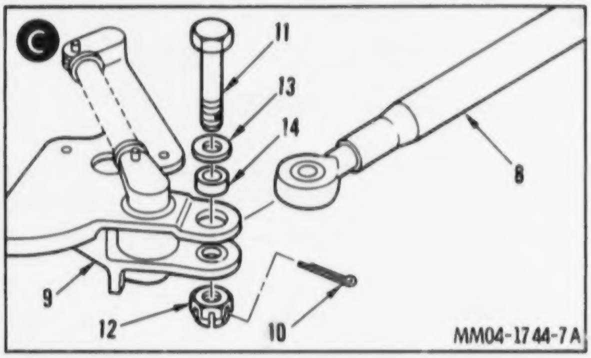
5. **Disconnect longitudinal FS 137 push-pull rod (8) from SPAD (9).**

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11). Remove nut (12).

   c. Remove bolt (11), washer (13), bushing (14) (if required), and rod (8) from SPAD (9).





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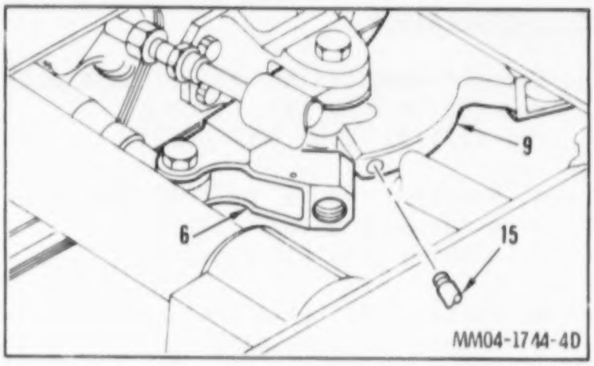
6. **Remove broken shear pin half (15) from SPAD (9).**

   a. Move lever (6) to allow access to shear pin half (15).

   b. Remove shear pin half (15) from SPAD (9).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check SPAD and push-pull rod for damage and wear** (para 11-3-1).
2. **Check SPAD and push-pull rod for corrosion** (para 1-5-38).
3. **Check retainer for damaged threads.** None allowed.

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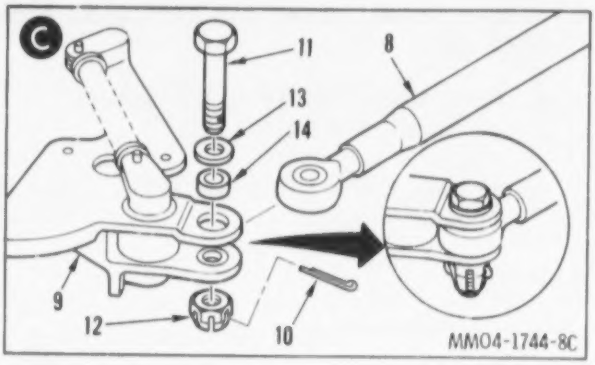
11-3-60. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-3-60

D. INSTALLATION



1. **Connect longitudinal FS 137 push-pull rod (8) to SPAD (9).** Torque nut (12) **30 TO 40 INCH-POUNDS.**

   a. Position rod (8) in SPAD (9) to aline bolt holes. Install bushing (14) (if required).

   b. Install bolt (11) through washer (13), bushing (14) (if required). SPAD (9), and rod end (16).

   c. Hold bolt (11). Install nut (12). Torque nut (12) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (10).

GO TO NEXT PAGE

11-3-60. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-3-60

2. Apply petrolatum (E16) to the tapered end of shear pin.

3. Install shear pin (17) through lever (6) and SPAD (9).

   a. Aline SPAD (9) and lever (6).

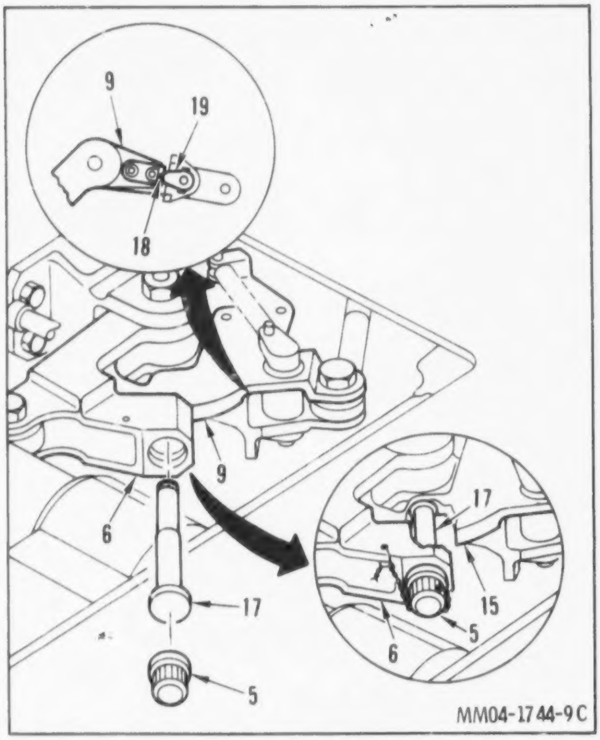
   b. Ensure that detent (18) and positioning lever (19) are engaged.

   c. Insert shear pin (17) through lever (6) and SPAD (9).

NOTE

Install retainer only fingertight.

4. Install retainer (5) in lever (6). Lockwire retainer (5) to lever (6). Use lockwire (E34).



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11-3-60. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-3-60

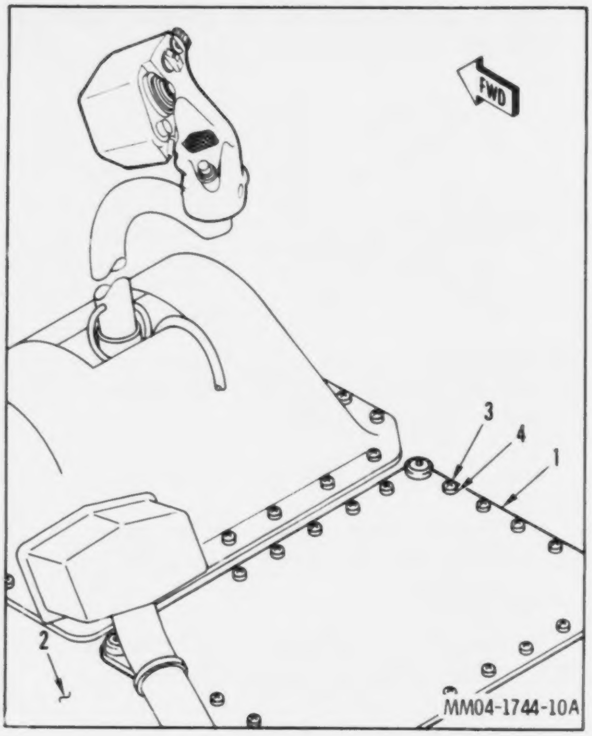
5. **Inspect (TI).**

6. **Perform flight control system operational check** (TM 55-1520-238-T).

7. **Install panel (1) in pilot floor (2).** Install 28 washers (4) and 28 screws (3).

8. **Install pilot cyclic stick cover** (para 11-3-28).

9. **Install pilot seat** (para 2-3-12).



END OF TASK

11-3-61. COLLECTIVE STICK STABILATOR MANUAL SWITCH REMOVAL 11-3-61

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Soldering Iron, Electric	3439-00-853-8760

Personnel Required:

68F10 Aircraft Electrician

Equipment Conditions:

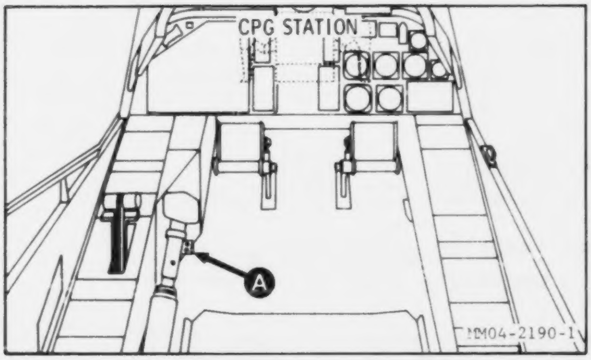
Ref	Condition
1-7-2	Helicopter safed

A. **REMOVAL**

1. **Enter pilot/CPG station** (para 1-7-1). **Observe all safety precautions.**

NOTE

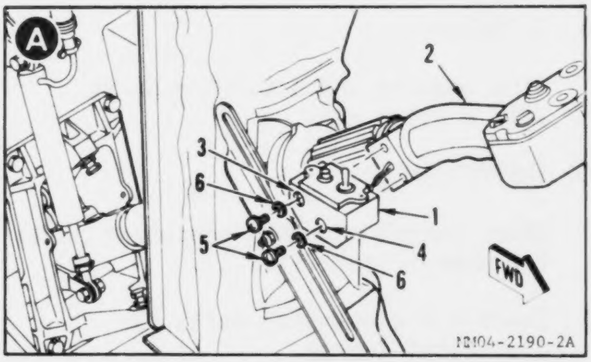
This task is typical for CPG or pilot station switch. CPG switch shown.



2. **Remove switch chassis (1) from collective stick (2).**

   a. Insert screwdriver through holes (3) and (4) in chassis (1).

   b. Remove two screws (5) and two washers (6).



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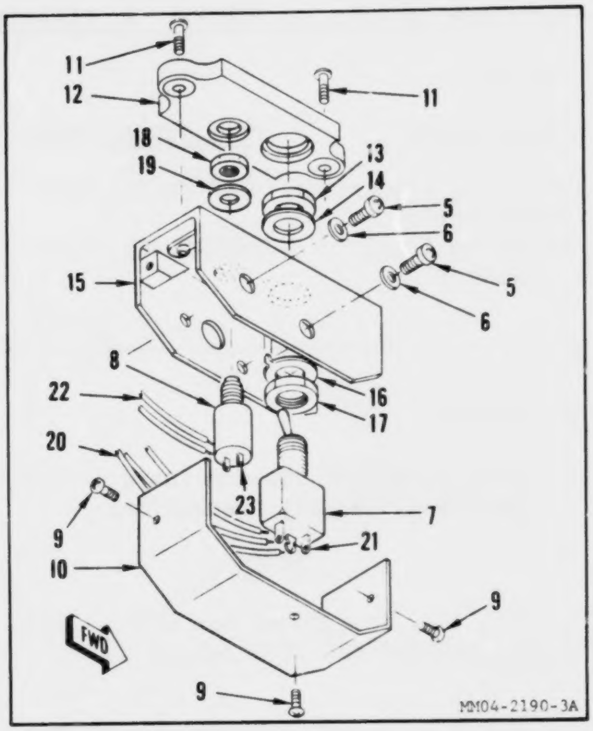
11-3-61. COLLECTIVE STICK STABILATOR MANUAL SWITCH REMOVAL (cont) 11-3-61



3. **Remove switches (7) and (8).**

   a. Remove three screws (9). Remove cover (10).

   b. Remove two screws (11). Remove panel (12).

   c. Remove nut (13) and washer (14) from angle (15). Remove switch (7).

   d. Remove lockwasher (16) and locknut (17) from switch (7).

   e. Remove nut (18) and washer (19) from angle (15). Remove switch (8).

4. **Identify wires (20) with terminals (21) of switch (7).**

5. **Identify wires (22) with terminals (23) of switch (8).**

6. **Desolder wires (20) and (22).**

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check switch assembly component parts for damage** (para 11-3-1).

2. **Check all electrical parts for electrical shorts.**

3. **Check switch assembly component parts for corrosion** (para 1-5-38).

END OF TASK

11-3-62. COLLECTIVE STICK STABILATOR MANUAL SWITCH INSTALLATION 11-3-62

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Soldering Iron, Electric	3439-00-853-8760

Personnel Required;

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

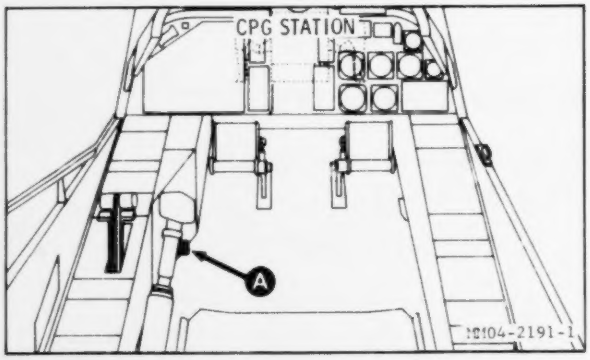
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter pilot/CPG station (para 1-7-1). Observe all safety precautions.**

NOTE

This task is typical for CPG or pilot station switch. CPG switch shown.



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11-3-62. COLLECTIVE STICK STABILATOR MANUAL SWITCH INSTALLATION (cont) 11-3-62

2. Solder identified wires (1) to terminals (2) of switch (3).

3. Solder identified wires (4) to terminals (5) of switch (6).

4. Install switch (3).

   a. Install switch (3) through hole (7) of angle (8).

   b. Install washer (9) and nut (10) on switch (3).

   c. Tighten nut (10).

5. Install switch (6).

   a. Install locknut (11) on switch (6).

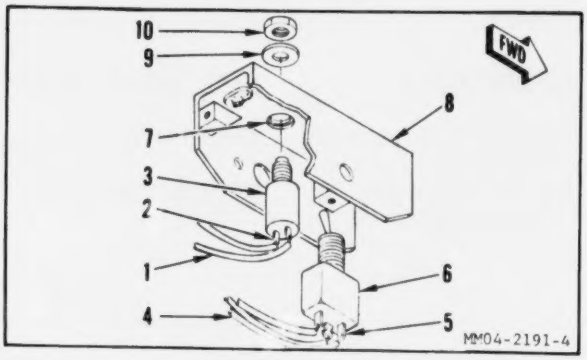
   b. Tighten locknut (11).

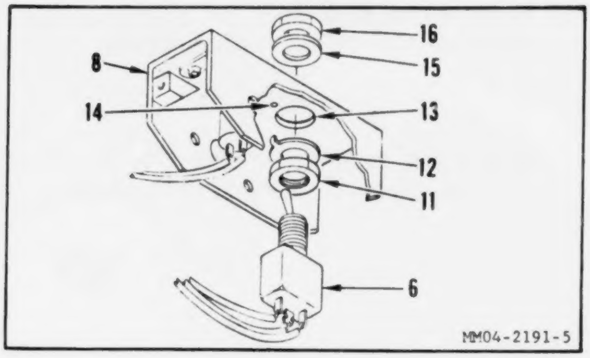
   c. Install lockwasher (12) on switch (6). Pass switch (6) up through hole (13) of angle (8).

   d. Aline tang of lockwasher (12) with hole (14) of angle (8).

   e. Install washer (15) and nut (16) on protruding threads of switch (6).

   f. Tighten nut (16).





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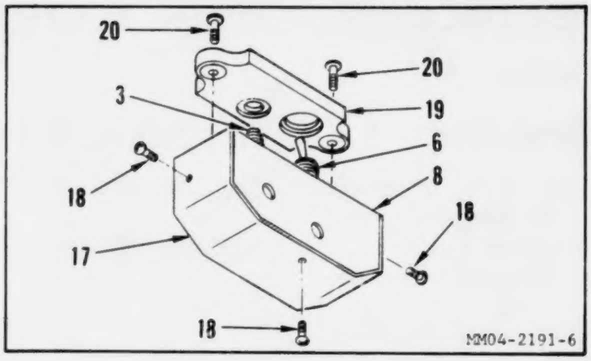
11-3-62. COLLECTIVE STICK STABILATOR MANUAL SWITCH INSTALLATION (cont) 11-3-62

6. **Attach cover (17) to angle (8).**

   a. Place cover (17) on angle (8) as shown.

   b. Install three screws (18).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7. **Install panel (19) to angle (8).**

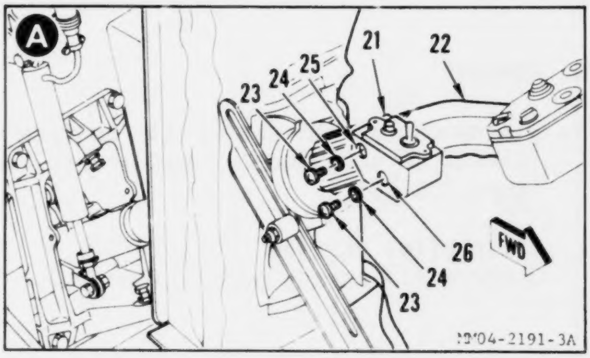
   a. Aline panel (19) over protruding switches (3) and (6) on top surface of angle (8) with markings up.

   b. Install two screws (20).

8. **Install switch chassis (21) on collective stick (22).**

   a. Install two washers (24) and two screws (23) through holes (25) and (26) into stick (22).

   b. Tighten two screws (23).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9. **Inspect (TI).**

10. **Perform stabilator operational check** (TM 55-1520-238-23).

END OF TASK

11-3-63. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION 11-3-63

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Controls System	1730-01-181-9270

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

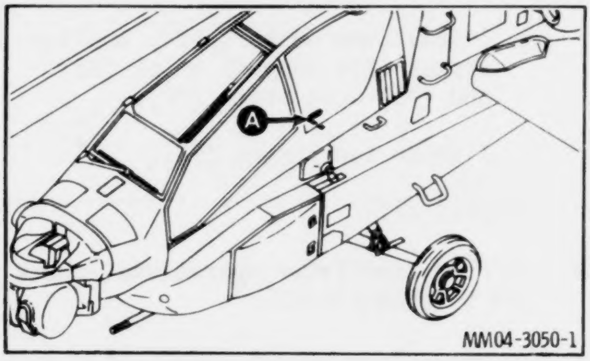
TM 55-1520-238-T

Equipment Conditions:

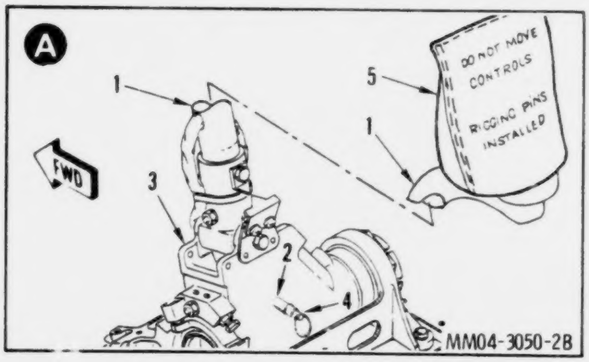
Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
2-2-2	Access cover L200 removed

A. REMOVAL

1. **Disconnect FS 165 push-pull rod from lateral servocylinder input lever (para 7-2-45).**
2. **Enter pilot station (para 1-7-1). Observe all safety precautions.**



3. **Slowly move pilot cyclic stick (1) to aline lateral rig pin holes (2) in cyclic stick support (3).**
4. **Install -5 rig pin (4) into rig pin holes (2).**
5. **Install cyclic stick warning cover (5) on cyclic stick (1).**



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11-3-63. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-63

6. **Remove access cover (6) from pilot floor (7).**

   a. Remove 16 screws (8), 16 washers (9), and 2 pins (10) from floor (7).

   b. Remove cover (6).

7. **Detach connector L22 (11) from connector J1047 (12).**

8. **Disconnect arm (14) from brake shaft (15).**

   a. Hold bolt (16).

   b. Remove nut (17) and washer (18).

   c. Remove bolt (16) and washer (18).

9. **Remove magnetic brake (13).**

   a. Remove four bolts (19) and four washers (20).

   b. Slide brake shaft (15) out of arm (14) and remove magnetic brake (13).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check magnetic brake and attaching parts for damage or wear** (para 11-3-1).

2. **Check magnetic brake and attaching parts for corrosion** (para 1-5-38).

D. **INSTALLATION**

1. **Install -5 rig pin (21) into rig pin holes (22) in bracket (23) and bellcrank (24).**

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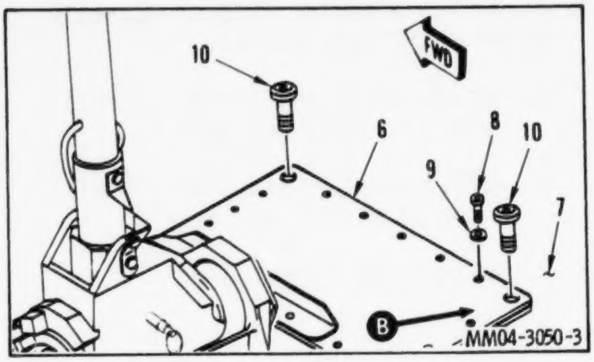
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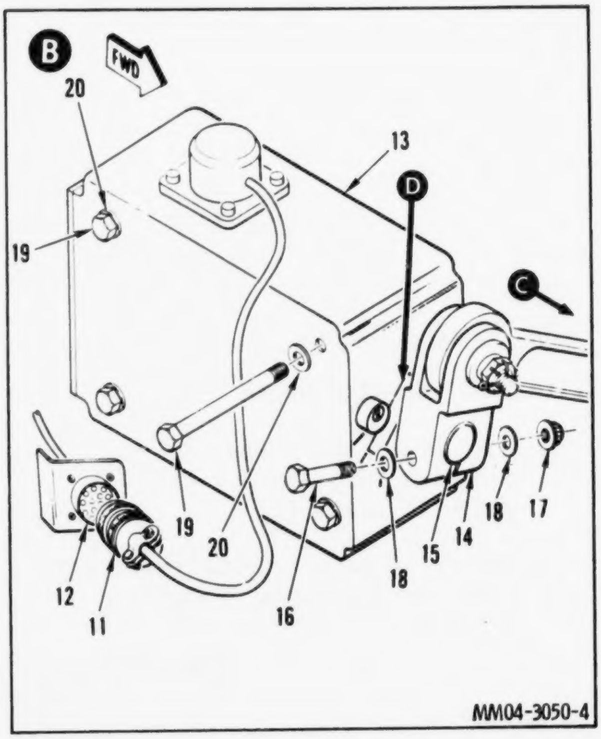
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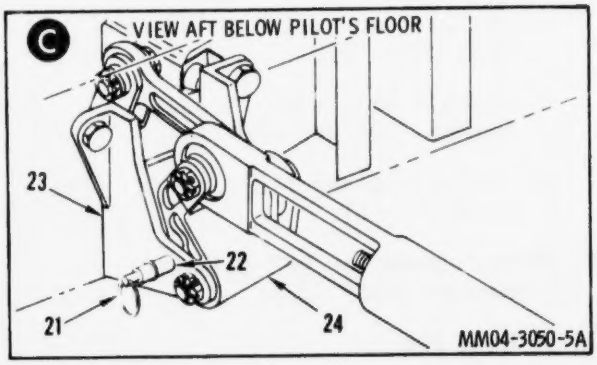
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11-3-63. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-63

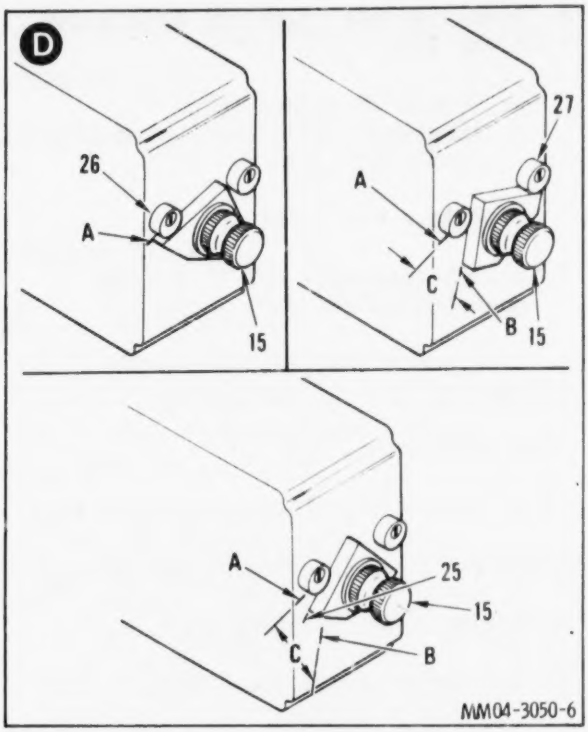
2. **Establish midpoint (25) of magnetic brake shaft (15) travel.**

   a. Rotate brake shaft (15) to full left stop (26) and mark A.

   b. Rotate brake shaft (15) to full right stop (27) and mark B.

   c. Measure and bisect dimension C.

   d. Mark midpoint (25) of brake shaft (15) travel.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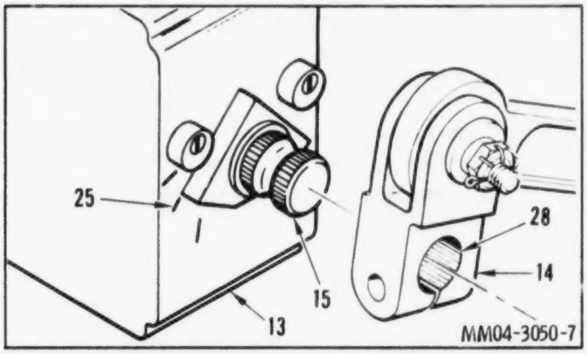
3. **Install magnetic brake (13).**

   a. Hold brake shaft (15) at midpoint (25) and position magnetic brake (13).

   b. Carefully insert brake shaft (15) into serrated bore (28) of arm (14).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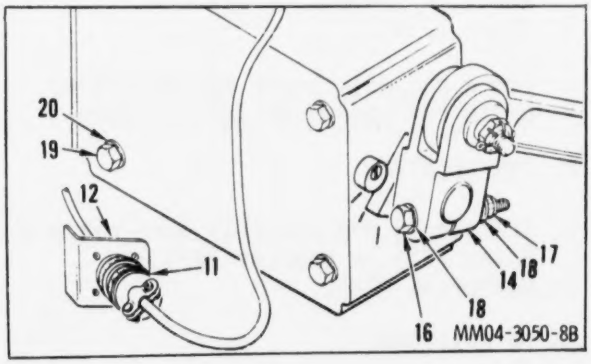
   c. Install four washers (20) and four bolts (19).

   d. Install bolt (16) through washer (18) and arm (14).

   e. Install washer (18) and nut (17) on bolt (16).

4. **Attach connector L22 (11) to connector J1047 (12).**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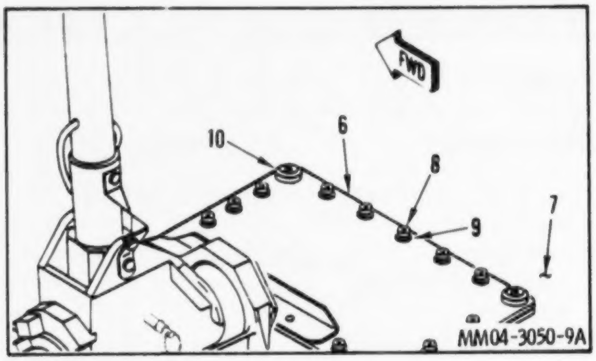
11-3-63. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-63

5. **Inspect (TI).**
6. **Install access cover (6) in pilot floor (7).**
   a. Install 16 washers (9) and 16 screws (8).
   b. Install two pins (10).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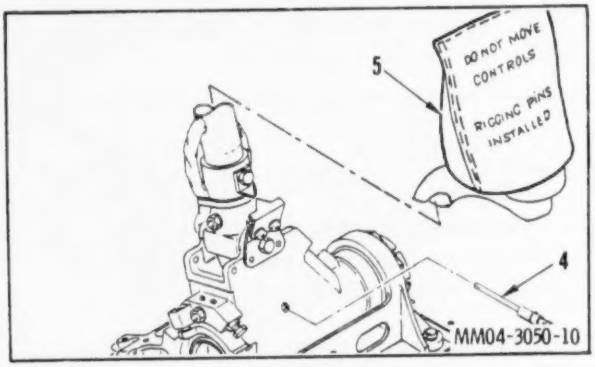
7. **Remove rig pins (4) and (21).**
8. **Remove cyclic stick warning cover (5).**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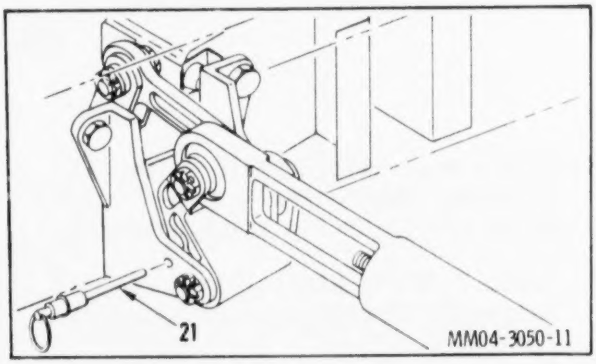

21
MM04-3050-11

9. **Install pilot cyclic stick cover** (para 11-3-28).
10. **Install FS 165 push-pull rod to lateral servocylinder input lever** (para 7-2-46).
11. **Secure access cover L200** (para 2-2-2).
12. **Perform flight control system operational check** (TM 55-1520-238-T).

END OF TASK

11-3-64. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION 11-3-64

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit Controls System	1730-01-181-9270

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

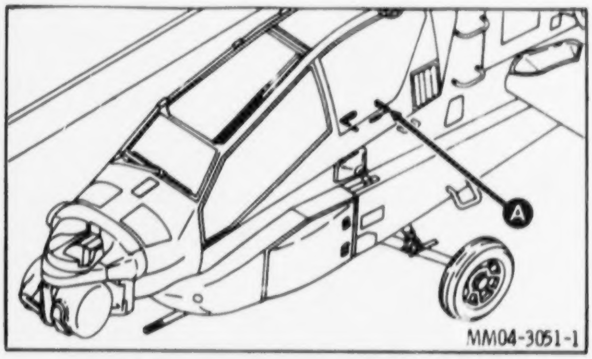
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
2-3-12	Pilot seat removed
2-2-2	Access panel R200 removed

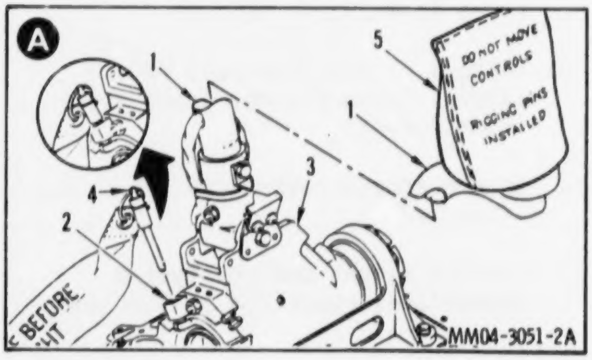
A. REMOVAL

1. **Disconnect FS 165 push-pull rod from longitudinal servocylinder input lever** (para 7-2-48).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**



MM04-3051-1

3. **Slowly move pilot cyclic stick (1) to aline longitudinal rig pin holes (2) in cyclic stick base (3).**
4. **Install -9 rig pin (4) into rig pin holes (2) in cyclic stick base (3).**
5. **Install cyclic stick warning cover (5).**



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11-3-64. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-64

6. **Remove access door (6) from pilot floor (7).**

   a. Remove 16 screws (8), 16 washers (9), and 2 pins (10) from floor (7).

   b. Remove door (6).

7. **Remove access door (11) from pilot floor (7).**

   a. Remove 28 screws (12), 28 washers (14), and 4 pins (16) from floor (7).

   b. Remove door (11).

8. **Detach connector L23 (13) from connector J1049 (15).**

9. **Disconnect shaft (18) from magnetic brake shaft (19).**

   a. Hold bolt (20).

   b. Remove nut (21) and washer (22).

   c. Remove bolt (20) and washer (23).

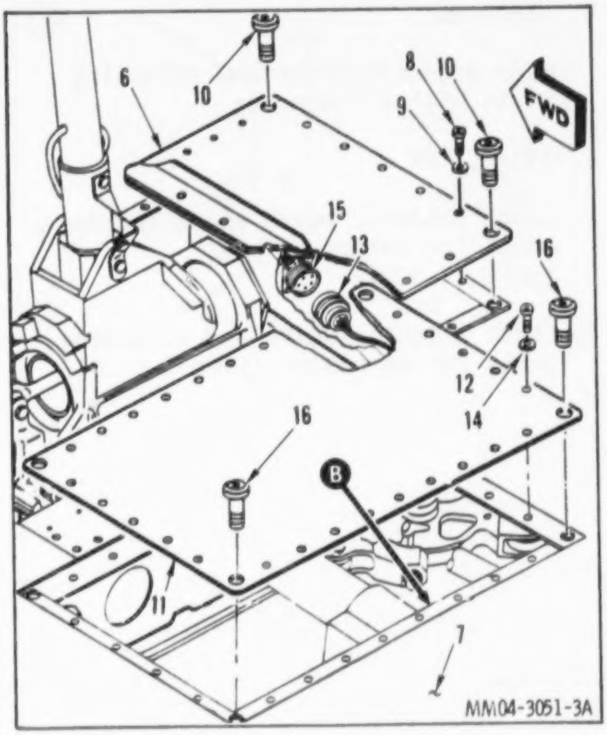
10. **Remove magnetic brake (17).**

    NOTE

    Install laminated washers in same position as removed.

    a. Remove four bolts (24), outside washers (25), inside washers (26), and laminated washers (27).

    b. Slide brake shaft (19) out of mechanism assembly shaft (18). Remove magnetic brake (17).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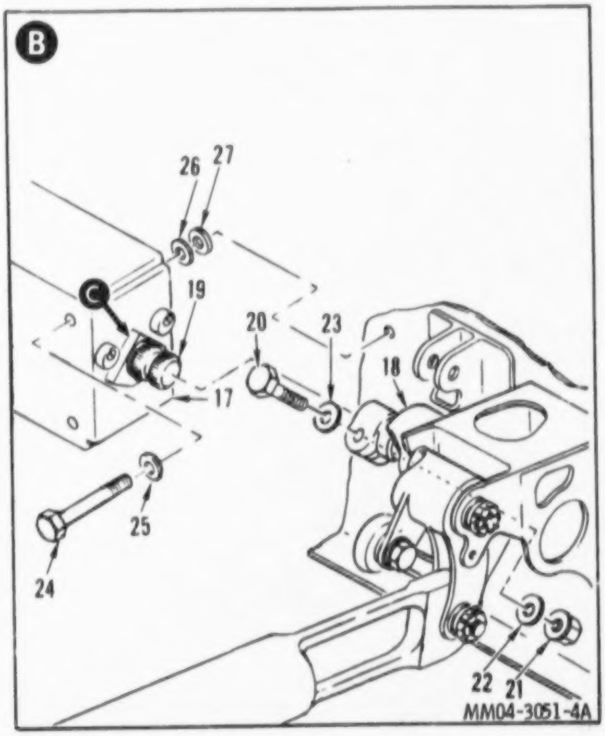
B
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MM04-3051-4A

GO TO NEXT PAGE

B. CLEANING

Wipe magnetic brake and attaching parts with a clean rag.

C. INSPECTION

1. Check magnetic brake and attaching parts for damage or wear (para 11-3-1).
2. Check magnetic brake and attaching parts for corrosion (para 1-5-38).

GO TO NEXT PAGE

11-3-64. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-64

D. INSTALLATION

1. **Establish midpoint (28) of magnetic brake shaft (19) travel.**

   a. Rotate brake shaft (19) to full left stop (29) and mark A.

   b. Rotate brake shaft (19) to full right stop (30) and mark B.

   c. Measure and bisect dimension C.

   d. Mark midpoint (28) of brake shaft (19) travel.

2. **Install -5 rig pin (31) into rig pin holes (32) in bracket (33) and bellcrank (34).**

3. **Install magnetic brake (17).**

   a. Hold brake shaft (19) at midpoint (28) and position magnetic brake (17).

   b. Carefully insert brake shaft (19) into serrated bore (35) of mechanism assembly shaft (18).

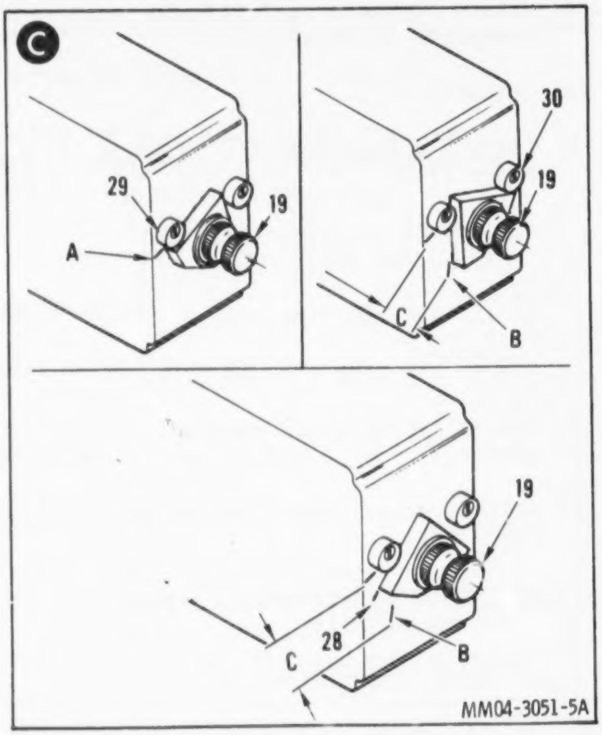
NOTE

Laminated washers should be installed in same position as removed.

   c. Install four outside washers (25), four inside washers (26), four laminated washers (27), and four bolts (24).

   d. Install washer (22) and bolt (20).

   e. Hold bolt (20). Install washer (23) and nut (21).



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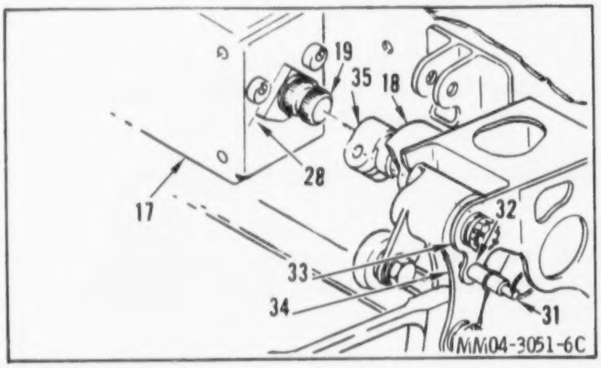

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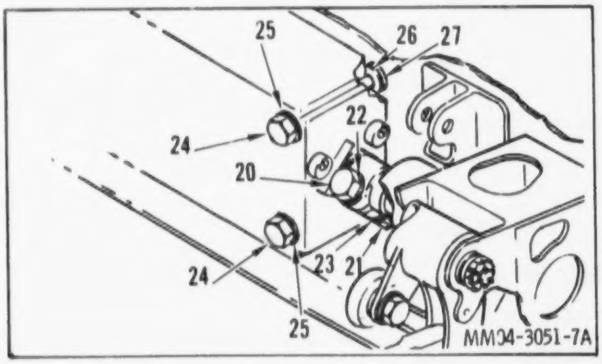

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11-3-64. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-3-64

4. **Attach connector L23 (13) to connector J1049 (15).**

5. **Inspect (TI).**

6. **Install access door (6) in pilot floor (7).**

   a. Install 16 washers (9) and 16 screws (8).

   b. Install two pins (10).

7. **Remove rig pins (4) and (31).**

8. **Remove cyclic stick warning cover (5).**

9. **Install access door (11) in pilot floor (7).**

   a. Install 28 washers (14) and 28 screws (12).

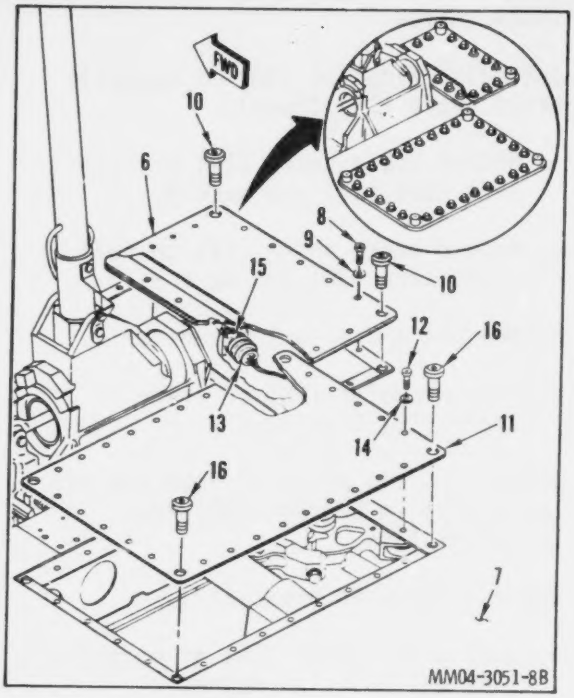
   b. Install four pins (16).

10. **Install pilot cyclic stick cover (para 11-3-28).**

11. **Install FS 165 push-pull rod to longitudinal servocylinder input lever (para 7-2-49).**

12. **Secure access cover R200 (para 2-2-2).**

13. **Perform flight control system operational check (TM 55-1520-238-T).**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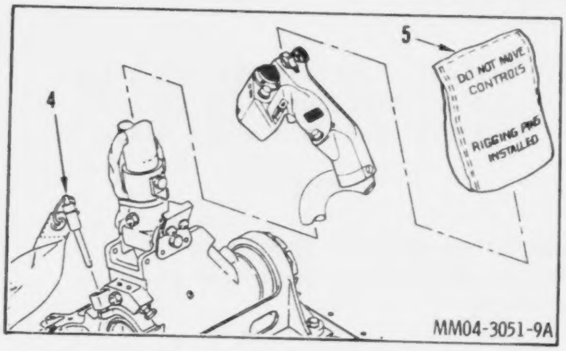
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DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
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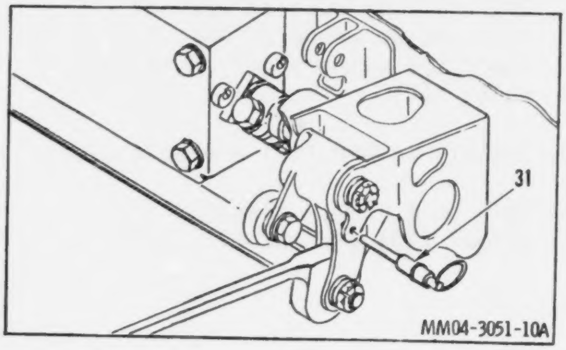
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END OF TASK

11-3-65. MOTIONAL TRANSDUCER SUPPORT BRACKET REPLACEMENT 11-3-65

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Tool Kit, Airframe Repairer's	5180-00-323-4876
Socket, 1-1/16, 1/2 Drive	5120-00-935-7427
Wrench, 1-1/16 & 1-1/4 inch Open-end	5120-00-187-7134
Wrench, Torque 1/2 Drive	5120-00-270-3121

Materials/Parts:

	Cotter Pin
(E22)	Methyl Ethyl Ketone
(E23)	Adhesive

Personnel Required:

67R10	Attack Helicopter Repairer
68G10	Aircraft Structural Repairer
66R30	Inspector/Supervisor

References:

TM 55-1500-204-25/1

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 opened
9-6-30	Motional transducer removed

A. REMOVAL

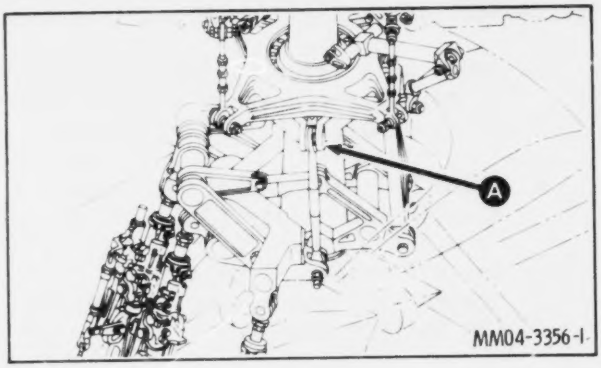
1. **Disconnect lateral link (1) from swashplate (2).**

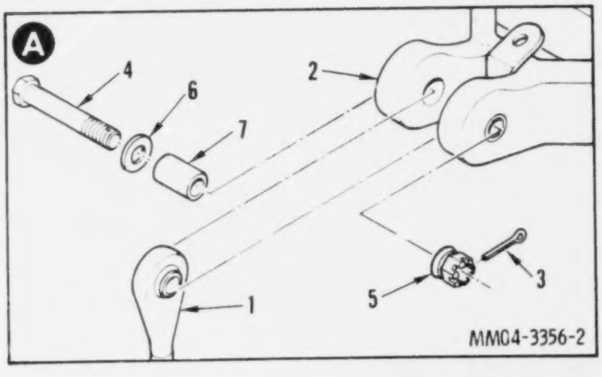
   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5). Use 1-1/16 inch open-end wrench and 1-1/16 inch socket.

   c. Remove bolt (4), washers (6) (if installed), and bushing (7).

   d. Move lateral link (1) clear of swashplate (2).





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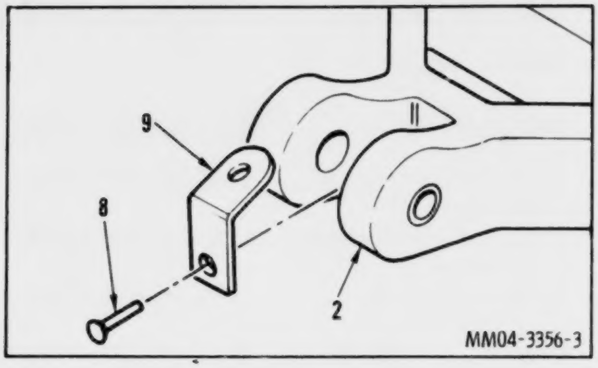
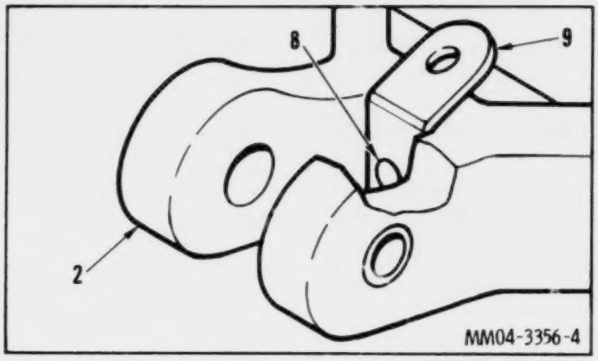
2. **Remove rivet (8) attaching bracket (9) to swashplate (2)** (TM 55-1500-204-25/1).





B. CLEANING

Remove excessive adhesive from surface of swashplate. Use a clean rag and MEK (E22) (para 1-5-36).

C. INSPECTION

Check swashplate for:

a. Cracks. None allowed.

b. Corrosion (para 1-5-38).

c. Elongated rivet hole. None allowed.

D. INSTALLATION

1. **Install bracket (9) on swashplate (2).**

   a. Apply thin layer of adhesive (E23) to mating surfaces of bracket (9) and swashplate (2).

   b. Aline hole in bracket (9) with hole in swashplate (2).

   c. Install rivet (8) through bracket (9) and swashplate (2) (TM 55-1500-204-25/1).

GO TO NEXT PAGE

2. **Connect lateral link (1) to swashplate (2).**

   a. Aline link (1) with swashplate (2).

   b. Install bushing (7) in swashplate (2).

   c. Insert bolt (4) through washers (6) (if required), bushing (7), swashplate (2), and link (1).

   d. Hold bolt (4) and install nut (5).

3. **Torque nut (5) 900 to 1100 INCH-POUNDS.**

   a. Hold bolt (4). Use 1-1/16 inch open-end wrench.

   b. Torque nut (5) to **900 INCH-POUNDS.** Use 1-1/16 inch socket and 1/2 drive torque wrench.

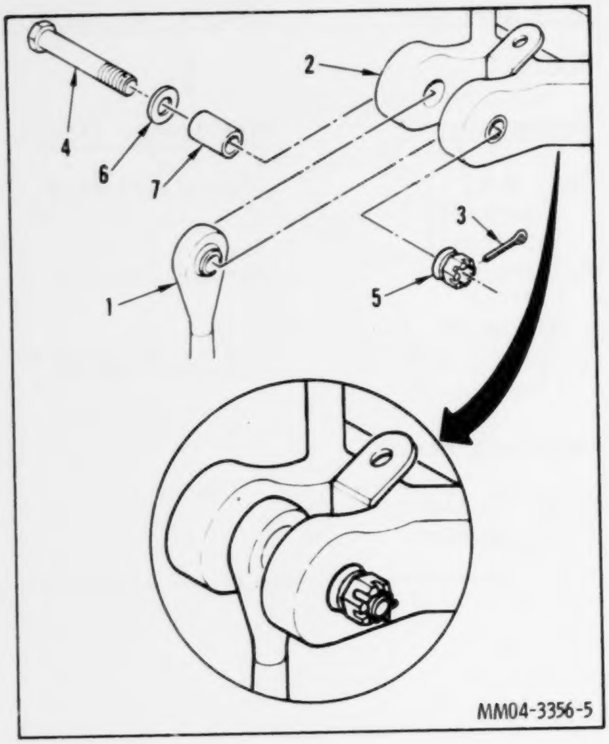
   c. Increase torque to aline cotter pin holes, but do not exceed **1100 INCH-POUNDS.**

   d. Install new cotter pin (3).

4. **Inspect (TI).**

5. **Install motional transducer** (para 9-6-30).

6. **Secure access doors T250L, T250R, T290L, T290R and L325** (para 2-2-2).



END OF TASK

11-3-66. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT 11-3-66

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSN-45	6625-01-139-2512
Soldering Iron, Electric	3439-00-853-8760

Materials/Parts:

(E12) Sealant
(E50) Solder

Personnel Required:

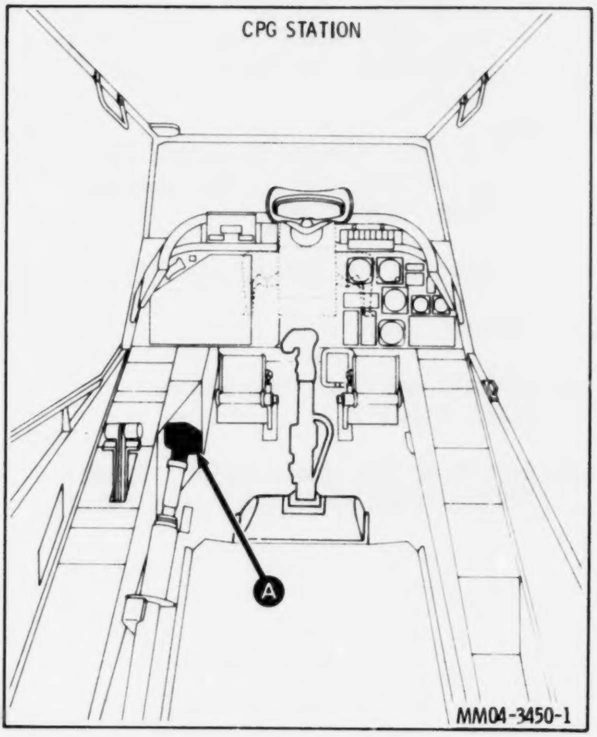
68F10	Aircraft Electrician
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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11-3-66. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT (cont) 11-3-66

A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.

2. Remove three screws (1) from collective stick (2). Move switch mount (3) out of the way.

3. Remove trigger grip switch (4) from collective stick (2).

WARNING

Soldering iron can cause severe burns to presonnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

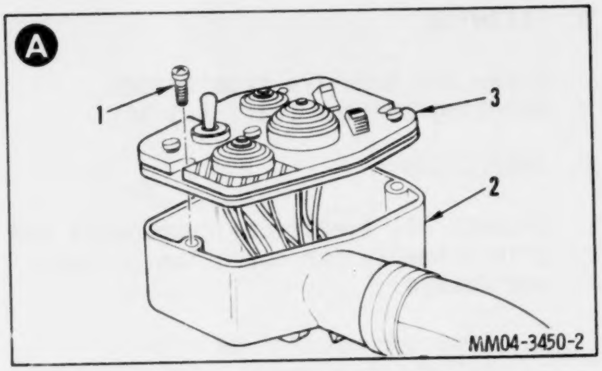
a. Identify three wires (5).

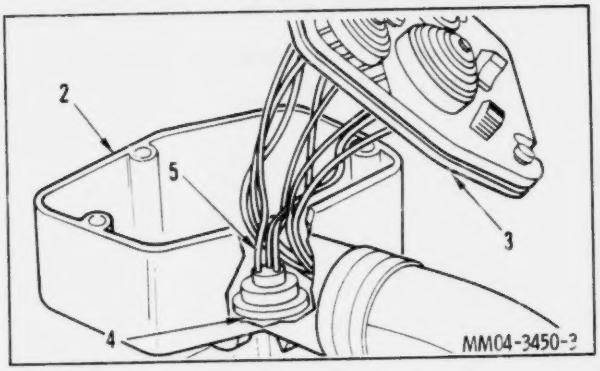
b. Desolder three wires (5). Use soldering iron.

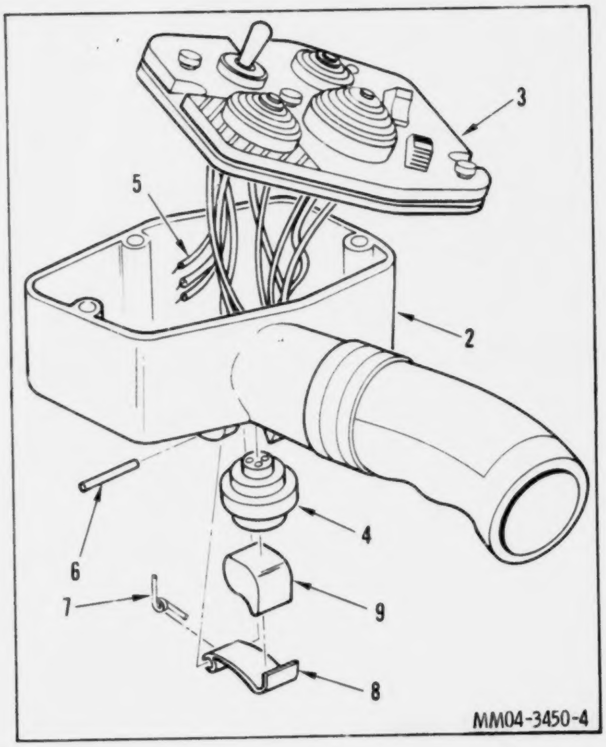
c. Remove grip control pin (6).

d. Remove spring (7), trigger guard (8), and trigger (9).

e. Remove switch (4) from grip (2).







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11-3-66. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT (cont) 11-3-66

B. CLEANING

Clean old adhesive from switch mounting surface (para 1-5-36).

C. INSPECTION

Inspect all electrical components and grip assembly for corrosion, cracks, and damage.

a. Clean corrosion from all contaminated parts (para 1-5-38).

b. Replace all cracked or damaged parts.

GO TO NEXT PAGE

11-3-66. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT (cont) 11-3-66

D. INSTALLATION

1. **Install switch (4) in collective stick assembly (2).**

   a. Apply a small bead of sealant (E12) around the circumference of the switch (4) mounting shoulder (10).

   b. Press switch (4) into mounting hole.

   c. Wipe away excessive adhesive. Use a clean rag.

   d. Assemble trigger (9), trigger guard (8), and spring (7). Install trigger assembly on collective stick (2) using grip control pin (6).

   e. Secure grip control pin (6) at both ends with a small drop of sealant (E12).

   f. Prepare wire ends (5) for soldering.

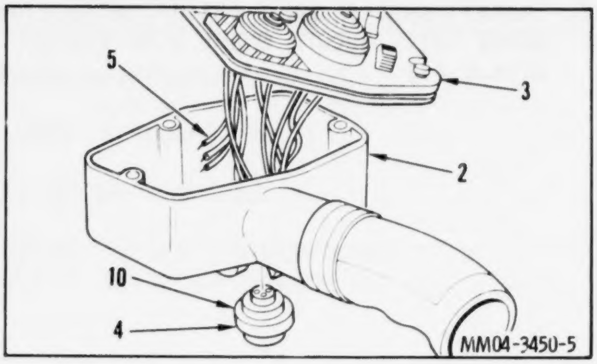
   g. Place wire ends (5) at terminals (11) previously identified.

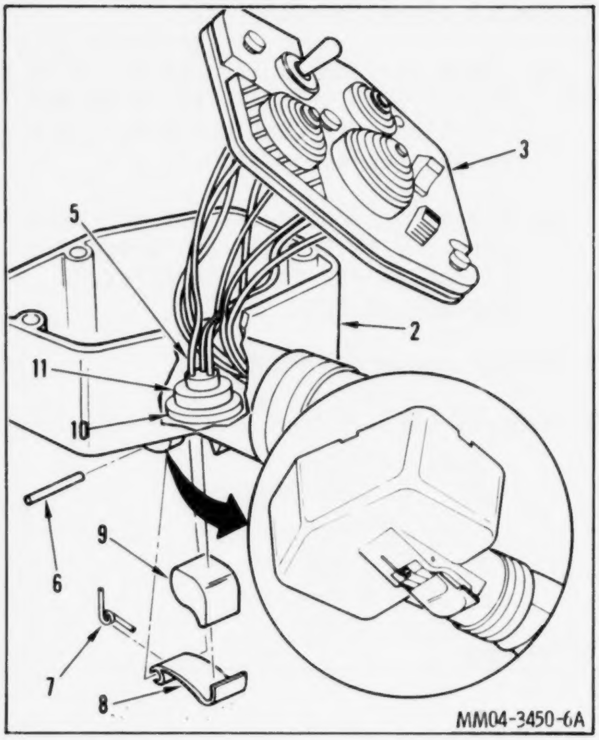
WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

   h. Solder three wires (5) to switch terminals (11), using soldering iron and solder (E50).

   i. Wrap excess wire around shoulder (10).





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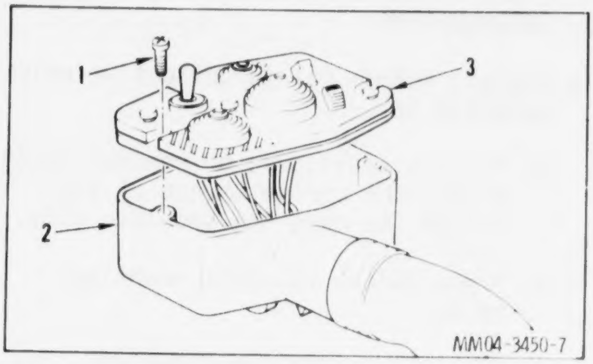
11-3-66. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT (cont) 11-3-66

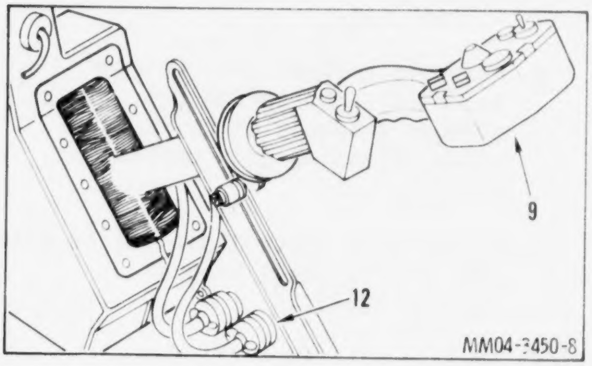
2. **Install switch mount (3) in collective stick (2).** Secure mount with three screws (1).



3. **Detach connector P108 (12).**

   a. Check for continuity between P108-h and -E with trigger (9) in normal position. If continuity does not exist, replace switch.

   b. Check for continuity between P108-i and -h with trigger (9) pressed. If continuity does not exist, replace switch.



4. **Attach connector P108 (12).**

5. **Inspect (TI).**

END OF TASK

11-3-67. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) 11-3-67

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Wrench, Torque, 1/4 inch Square Drive	5120-00-117-4832
Multimeter Digital AN/PSM-45	6625-01-139-2515

Materials/Parts:

(E69) Compound, Potting

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

References:

Tm 55-1520-238-T

NOTE

This task is typical for all SPAD switches.

A. **REMOVAL**

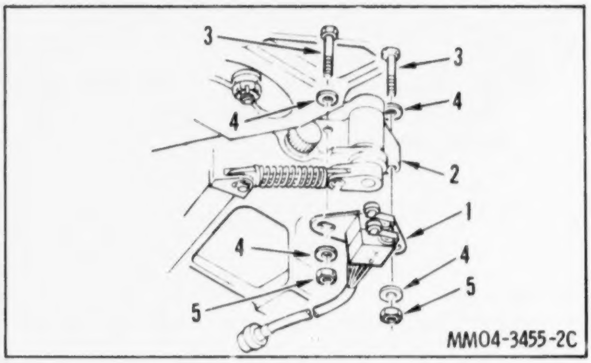
Remove SPAD switch (1) from SPAD (2).

a. Hold two screws (3). Remove two nuts (5) and two washers (4).

b. Remove two screws (3) and two washers (4).

c. Remove switch (1) from SPAD (2).

d. Remove potting compound from SPAD (2).



B. **CLEANING**

Wipe switch mounting area using a clean dry rag.

GO TO NEXT PAGE

11-3-67. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) (cont) 11-3-67

C. INSPECTION

Visually inspect switch mounting area and cam actuator for cracks and corrosion.

a. Replace cracked components.

b. Clean all corrosion from components (para 1-5-38).

D. INSTALLATION

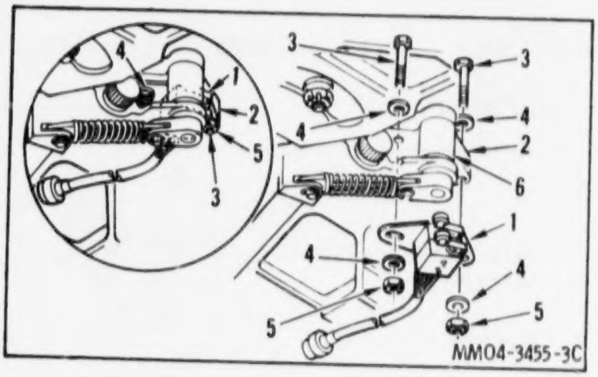
1. **Install SPAD switch (1) on SPAD (2).**

   a. Apply thin layer of potting compound on the mating surfaces of the SPAD switch (1) and SPAD (2). Use potting compound (E69).

   b. Position switch (1) on SPAD (2).

   c. Install two screws (3), through two washers (4), SPAD (2) and switch (1).

   d. Hold two screws (3). Install two washers (4) and two nuts (5). Do not tighten nuts (5).



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NOTE

- Ensure that step 2 is completed before potting compound cure out.
- Both mounting screws (3) must be loose to facilitate proper adjustment.

2. **With shear pin installed, adjust switch (1) to cam actuator valley (7).**

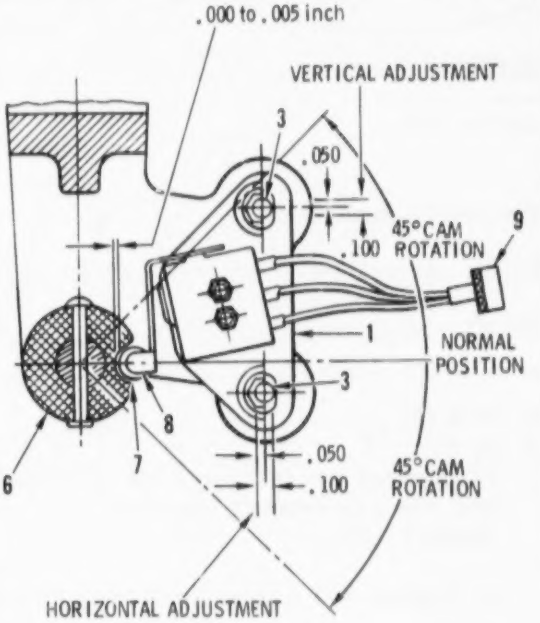
   a. Adjust switch (1) horizontally to provide a 0.000 to 0.005-inch gap between cam actuator valley (7) and switch cam roller (8).

   b. Adjust switch vertically to aline switch cam roller (8) with center of the cam actuator valley (7).

   c. Tighten screws (3) to hold switch (1) in place. Torque nuts to **7 to 9 INCH-POUNDS**. Wipe off potting compound squeeze out.

   d. Allow potting compound to cure for 24 hours at ambient temperature.

   e. Press switch cam roller (8) toward switch to actuate switch (1). Check for continuity at connector P1 (9), between P1-1 and P1-2, P1-4 and P1-5. If continuity is not found, replace switch.


.000 to .005 inch
VERTICAL ADJUSTMENT
3
.050
.100
45°CAM ROTATION
9
1
NORMAL POSITION
3
8
7
6
.050
.100
45°CAM ROTATION
HORIZONTAL ADJUSTMENT
MM04-3455-4C

END OF TASK

11-3-68. CPG COLLECTIVE SUPPORT REMOVAL/INSTALLATION 11-3-68

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-117-4832

Materials/Parts:

Cotter Pin

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
67R30	Inspector/Supervisor

References:

TM 9-1090-208-23
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-3-12	CPG seat removed
11-3-54	CPG collective stick cover removed
11-3-50	CPG collective stick assembly removed
11-4-17	CPG collective LVDT removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed
11-3-55	CPG collective stick spring removed

A. REMOVAL

1. **Disconnect collective FS96 pull-pull rod end (1) from collective support (2).**

   a. Remove and discard cotter pin (3).

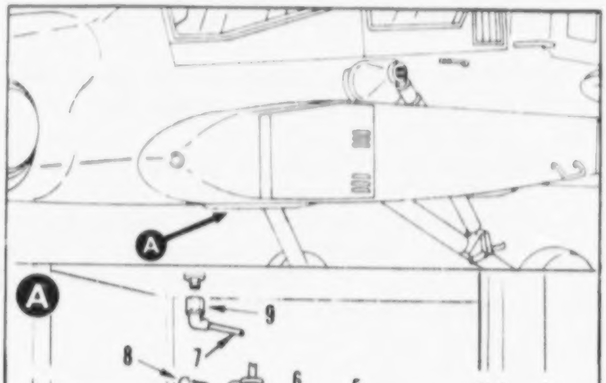
   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4) and washer (6) from rod (1) and support (2).

2. **Remove drain line (7).**

   a. Remove clamp screw (8) and two drain line nuts (9).

   b. Remove drain line (7).



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3. **Detach connector A334P1 (10) from connector J268 (11).**

CAUTION

To prevent damage to flight controls or airframe structure, hold collective support when removing attaching hardware. Failure to do so may allow support to fall as fourth nut is removed.

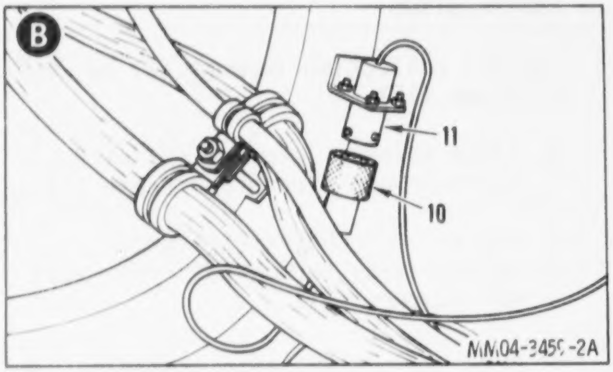
4. **Remove collective support (2) from airframe (12).**
   a. Hold four bolts (13). Remove four nuts (14) and washers (15).
   b. Remove four bolts (13) and washers (16) from support (2).
   c. Remove support (2) from airframe (12).

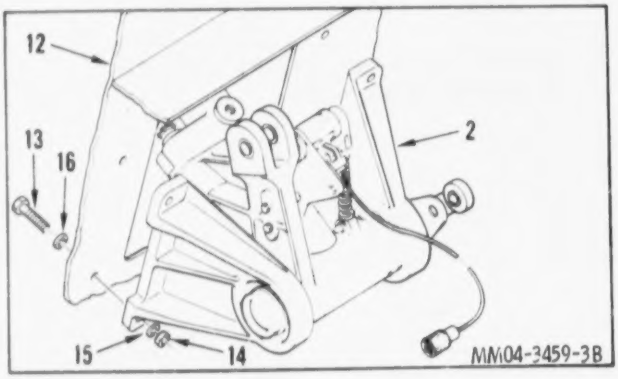
B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check support and airframe for cracks.** None allowed.
2. **Check support and airframe for corrosion** (para 1-5-38).
3. **Check push-pull rod and support for dents, scratches, and depressions** (para 11-3-1).





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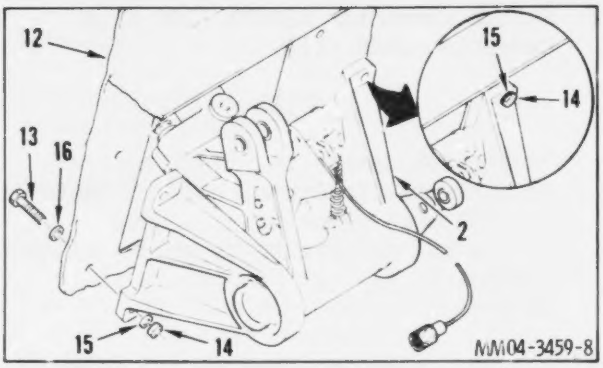
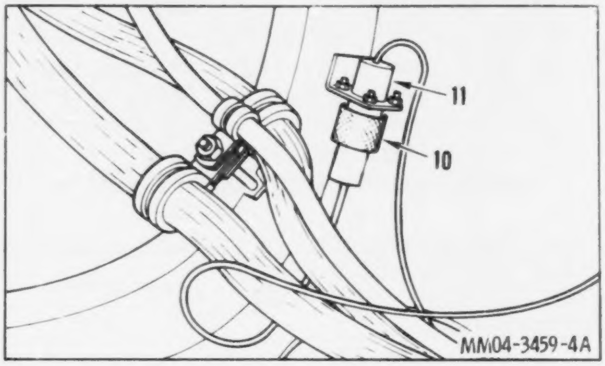
D. INSTALLATION

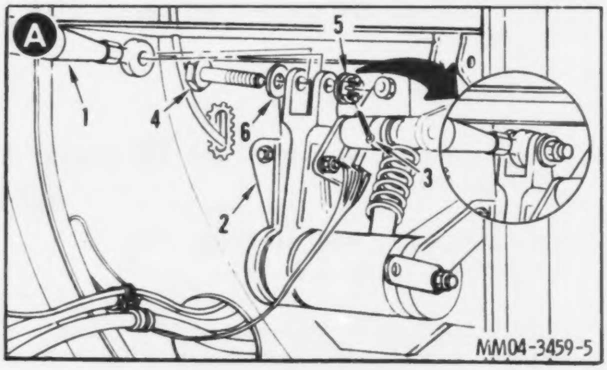
1. **Install collective support (2) on airframe (12).**
   - a. Aline holes of support (2) with holes on aft side of airframe (12).
   - b. Install four bolts (13) and washers (16) through airframe (12) and support (2).
   - c. Hold four bolts (13). Install four washers (15) and nuts (14).



2. **Attach connector A334P1 (10) to connector J268 (11).**



3. **Install collective FS96 push-pull rod end (1) on support (2).** Torque nut (5) to **30 TO 40 INCH-POUNDS.**
   - a. Aline rod (1) with support (2).
   - b. Install bolt (4) and washer (6) through support (2) and rod (1).
   - c. Install nut (5).
   - d. Hold bolt (4). Torque nut (5) to **30 INCH-POUNDS.**
   - e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   - f. Install new cotter pin (3).



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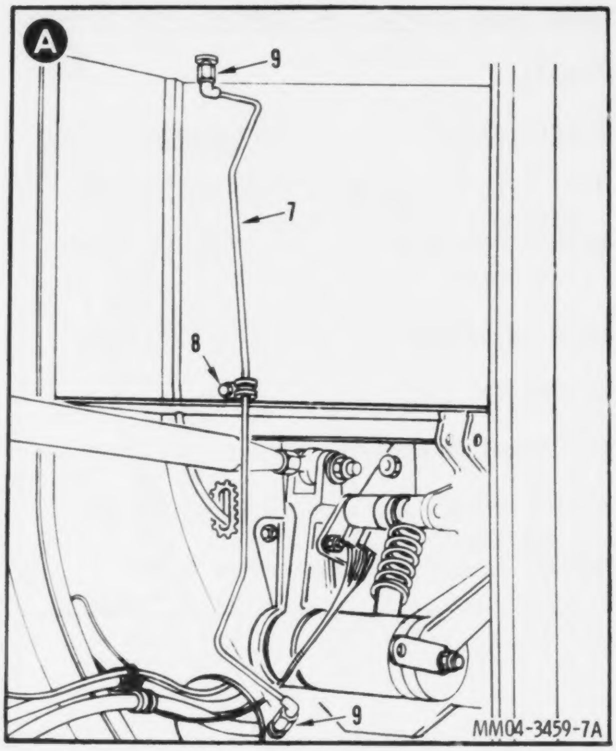
4. **Install drain line (7).**
   a. Aline drain line (7) with connecting drain line.
   b. Install two nuts (9).
   c. Install clamp screw (8).
5. **Install collective stick spring** (para 11-3-56).
6. **Install CPG collective LVDT** (para 11-4-18).
7. **Install CPG collective stick** (para 11-3-51).
8. **Install CPG collective stick cover** (para 11-3-54).
9. **Install CPG seat** (para 2-3-12).
10. **Perform collective flight control rigging operational check** (TM 55-1520-238-T).
11. **Install area weapon, turret, and flex chute** (TM 9-1090-208-23).



END OF TASK

11-3-69. PILOT COLLECTIVE SUPPORT REMOVAL/INSTALLATION 11-3-69

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-117-4832

Materials/Parts:

Cotter Pin (4)

Personnel Required:

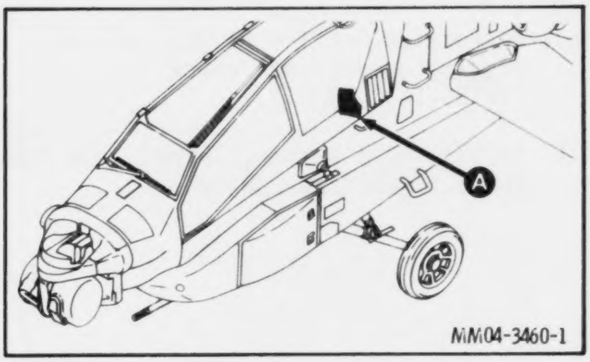
67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-3-12	Pilot seat removed
11-3-54	Pilot collective stick cover removed
11-3-50	Pilot collective stick removed
11-4-2	Pilot collective LVDT removed
4-8-58	Pilot variable resistor removed
10-3-1	Fwd fuel cell removed
11-5-32	FS 156 directional bellcank removed



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11-3-69. PILOT COLLECTIVE SUPPORT REMOVAL/INSTALLATION (cont) 11-3-69

A. REMOVAL

1. **Remove upper end of cylinder (1) from bracket (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

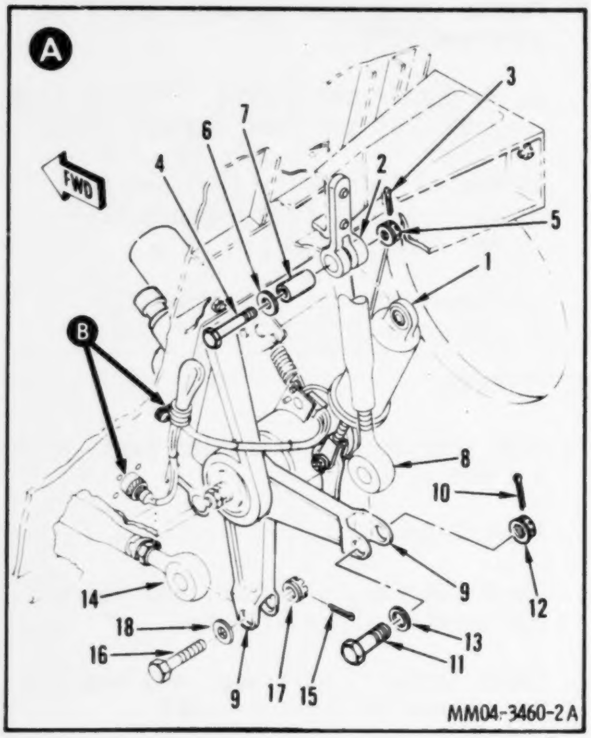
   c. Remove bolt (4), washer (6), and bushing (7).

2. **Disconnect rod end (8) from collective bellcrank (9).**

   a. Remove and discard cotter pin (10).

   b. Hold bolt (11). Remove nut (12).

   c. Remove bolt (11) and washer (13).


A
3
6
7
4
2
FWD
5
1
B
8
10
9
12
14
18
13
16
11
9
17
15
MM04-3460-2A

3. **Remove rod end (14) from collective bellcrank (9).**

   a. Remove and discard cotter pin (15).

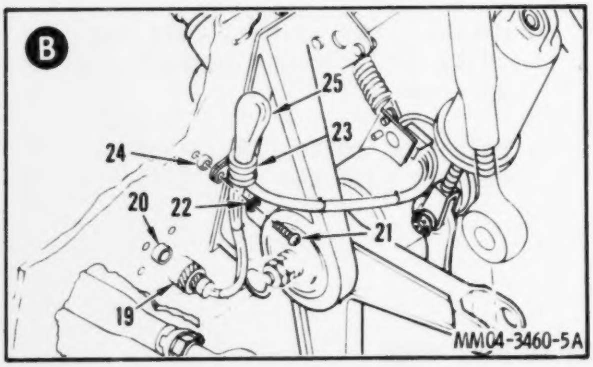
   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16) and washer (18).

4. **Detach connector A334P1 (19) from connector J272 (20).**

   a. Remove screw (21), washer (22), clamp (23), and spacer (24) from wire harness (25).

   b. Detach connector A334P1 (19) from connector J272 (20).


B
25
23
24
20
22
21
19
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11-3-69. PILOT COLLECTIVE SUPPORT REMOVAL/INSTALLATION (cont) 11-3-69

5. **Remove collective support (26) from airframe (27).**

   a. Hold four bolts (28). Remove four nuts (29) and four washers (30).

   b. Remove four bolts (28) and four washers (31) from support (26) and airframe (27).

   c. Remove support (26) from airframe (27).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check support, airframe, and rod end for cracks.** None allowed.

2. **Check support, airframe, and rod end for corrosion** (para 1-5-38).

3. **Check control rod and support for dents, scratches, and depressions** (para 11-3-1).

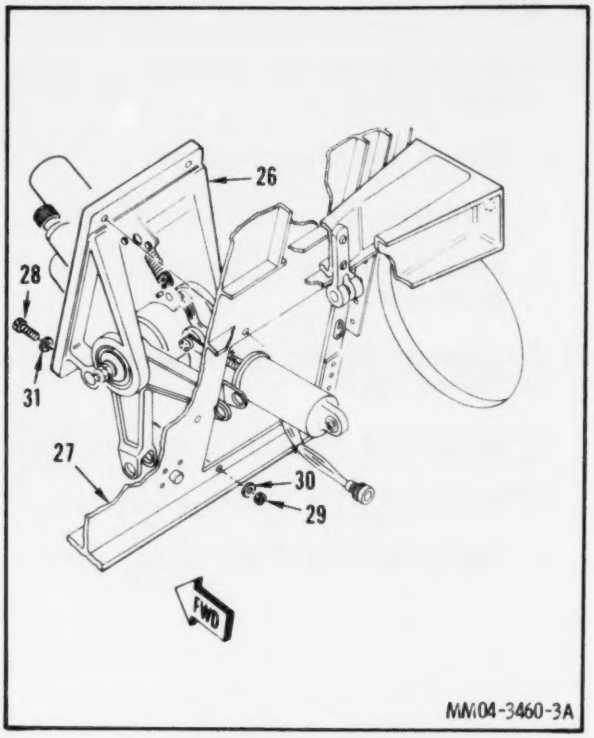
D. **INSTALLATION**

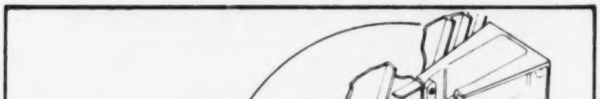
1. **Install collective support (26) on airframe (27).**

   a. Aline holes of support (26) with holes on forward side of airframe (27).

   b. Install four washers (31) and bolts (28) through support (26) and airframe (27).

   c. Hold four bolts (28). Install four washers (30) and nuts (29).





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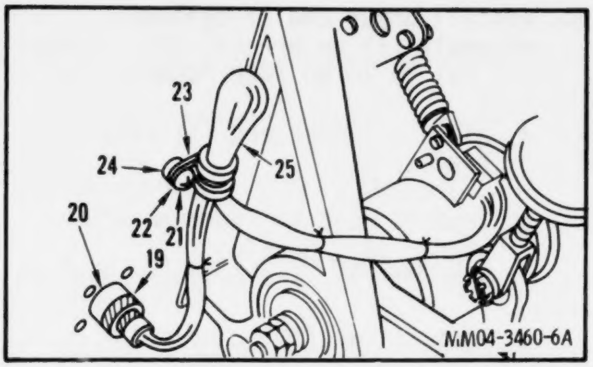
11-3-69. PILOT COLLECTIVE SUPPORT REMOVAL/INSTALLATION (cont) 11-3-69

2. **Attach connector A334P1 (19) to connector J272 (20).**

   a. Attach connector A334P1 (19) to connector J272 (20).

   b. Install screw (21) through washer (22), clamp (23), and spacer (24) on wire harness (25).



3. **Install rod end (14) on bellcrank (9).** Torque nut (8) **30 TO 40 INCH-POUNDS.**

   a. Aline rod end (14) with bellcrank (9).

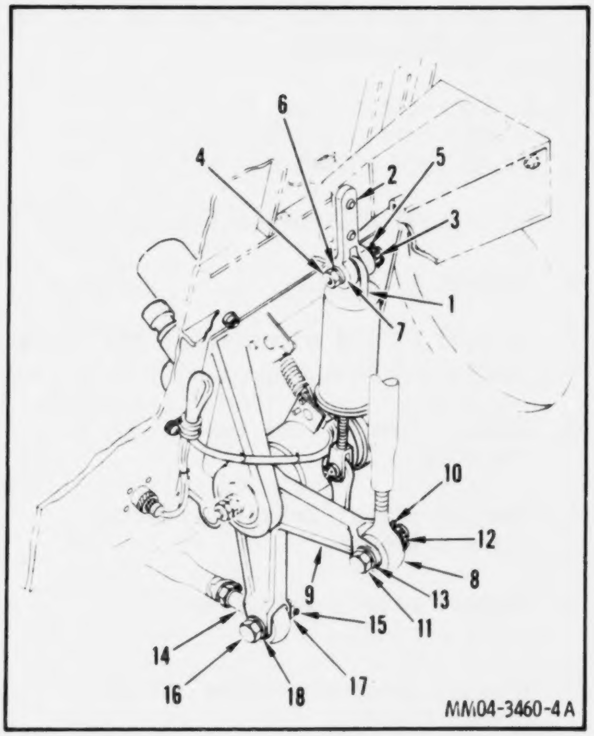
   b. Install bolt (16) through washer (18), bellcrank (9), and rod end (14).

   c. Install nut (17) on bolt (16).

   d. Hold bolt (16). Torque nut (17) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (15).



4. **Install rod end (8) on bellcrank (9).** Torque nut (10) **30 TO 40 INCH-POUNDS.**

   a. Aline rod end (8) with bellcrank (9).

   b. Install bolt (11) through washer (13), bellcrank (9), and rod end (8).

   c. Install nut (12) on bolt (11).

   d. Hold bolt (11). Torque nut (12) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (10).

GO TO NEXT PAGE

11-3-69. PILOT COLLECTIVE SUPPORT REMOVAL/INSTALLATION (cont) 11-3-69

5. **Install upper end of cylinder assembly (1) on bracket (2).** Torque nut (5) **30 TO 40 INCH-POUNDS.**

   a. Aline cylinder end (1) with bracket (2).

   b. Install bolt (4) through washer (6), bushing (7), bracket (2), and cylinder end (1).

   c. Install nut (5) on bolt (4).

   d. Hold bolt (4). Torque nut (5) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (3).

6. **Inspect (TI).**

7. **Install FS 156 directional bellcrank** (para 11-5-32).

8. **Install foward fuel cell** (para 10-3-2).

9. **Install pilot variable resistor** (para 4-8-59).

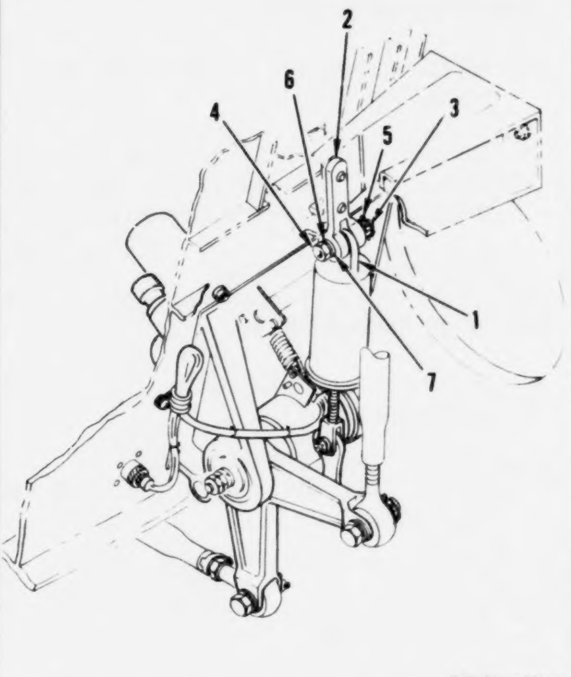
10. **Install pilot collective LVDT** (para 11-4-3).

11. **Install pilot collective stick** (para 11-3-51).

12. **Install pilot collective stick cover** (para 11-3-54).

13. **Perform collective flight control rigging operational check** (TM 55-1520-238-T).

14. **Install pilot seat** (para 2-3-12).



END OF TASK

Section IV. FLIGHT CONTROLS MAINTENANCE

11-4-1. FLIGHT CONTROLS (ASE) INSPECTION 11-4-1

1. **Check components for damage and mounting security.**
2. **Check for loose, missing, or damaged mounting hardware.**
3. **Check wire bundles for chafing, loose mounting, and broken or missing wire ties.**
4. **Check wiring for cracked, broken, or burned insulation.**
5. **Check connectors for loose attachment.**
6. **Check switches for cracked or broken knobs and loose mounting.**
7. **Check LVDT rod ends for play.** Inspect LVDTs for nicks, cracks, and gouges. None allowed.
8. **Bushings and bearings.** Maximum allowable wear limits:
   a. Radial play with bolt in bushing or bearing inside diameter - **0.004-inch.**
   b. Radial play with sliding bushing in flanged inside diameter - **0.004-inch.**
   c. Radial play in ball bearing - **0.002-inch.**
   d. Radial play of Teflon bearing - **0.006-inch.**
   e. Radial play in control rod end bearing - **0.001-inch.**
   f. Axial play in Teflon bearing **0.016-inch.**
   g. Axial play in control rod end bearing - **0.009-inch.**
9. **Check stabilator actuator as follows:**
   a. Check sealing compound for condition.
   b. If sealing compound is in good condition, no further inspection is required.
   c. If sealing compound is missing or in poor condition, remove actuator (para 11-4-25), disassemble actuator (para 11-4-38), and inspect spacer for corrosion. If corrosion is found, replace actuator. If no corrosion is found, assemble actuator (para 11-4-38) and install actuator (para 11-4-25).

END OF TASK

11-4-2. PILOT COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-2

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

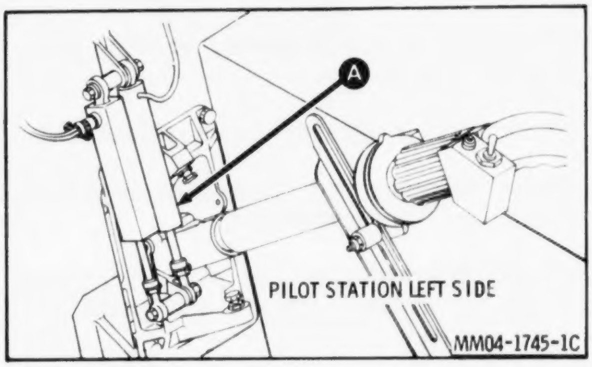
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-54	Pilot collective stick cover removed

A. REMOVAL

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**

2. **Open DASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**



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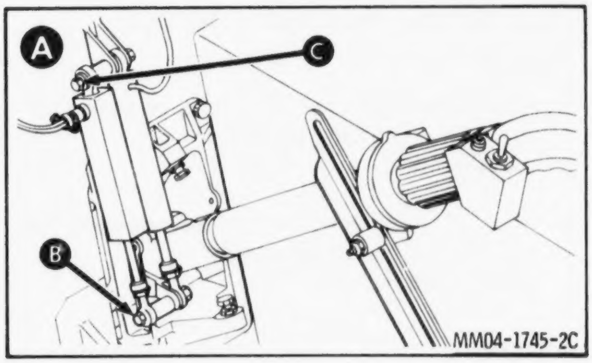

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11-4-2. PILOT COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-2

3. **Disconnect LVDT (6) and potentiometer (7) from arm (8).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10), washer (12), and spacer (13).

4. **Remove LVDT (6) and potentiometer (7) from bracket (14).**

   a. Remove and discard cotter pin (15).

   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16), washer (18), and spacer (19).

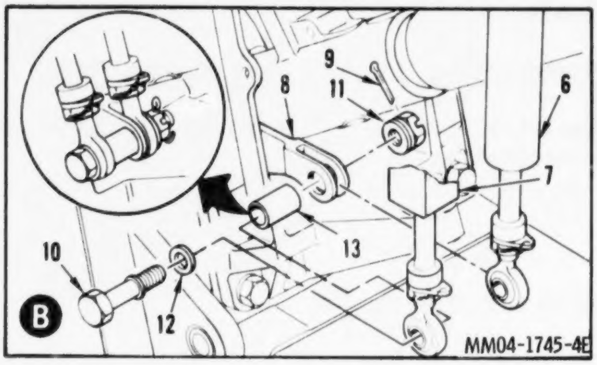
5. **Remove end bearing (20) from LVDT (6).**

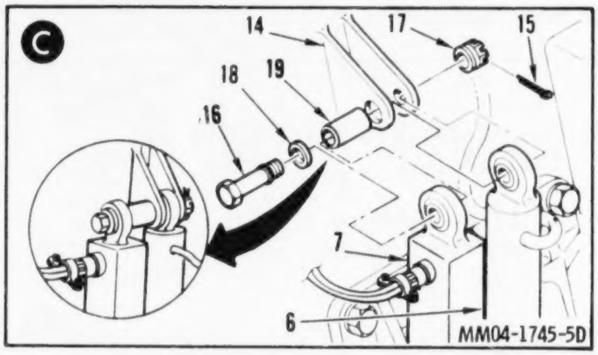
   a. Remove lockwire from nut (21) and lock washer (22).

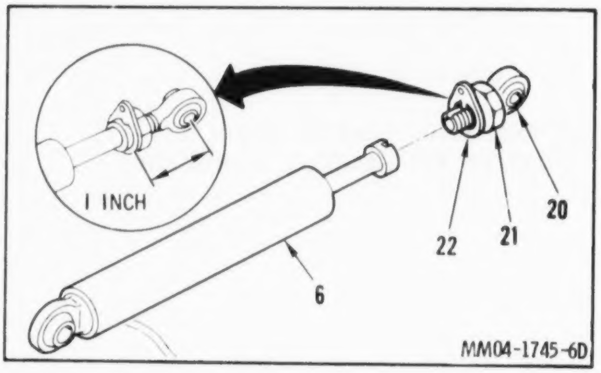
   b. Loosen nut (21).

   c. Unscrew rod end bearing (20) from LVDT (6).

   d. Retain lock washer (22) with rod end bearing (20).







B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check LVDT and attaching parts for damage** (para 11-4-1).

2. **Check LVDT and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-4-3. PILOT COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-3

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin (2)
(E29)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

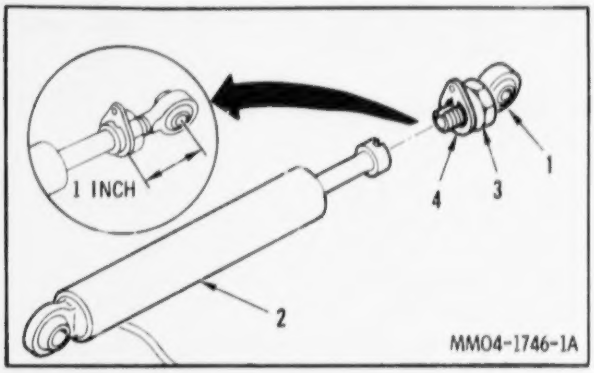
TM 55-1520-238-T

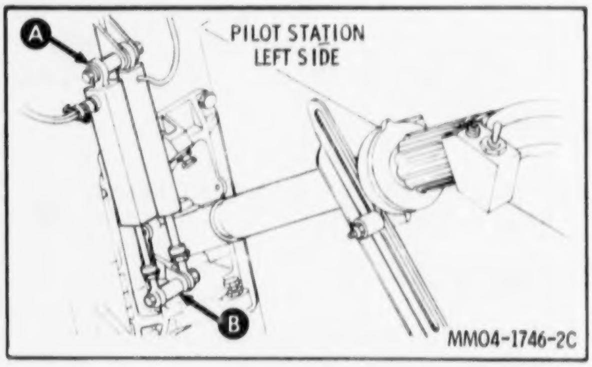
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Attach rod end bearing (1) to LVDT (2).**
   a. Screw bearing (1) with nut (3) and lock washer (4) into LVDT (2).
   b. Measure 1 inch between center of hole in bearing (1) and lock washer (4).
   c. Tighten nut (3).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**





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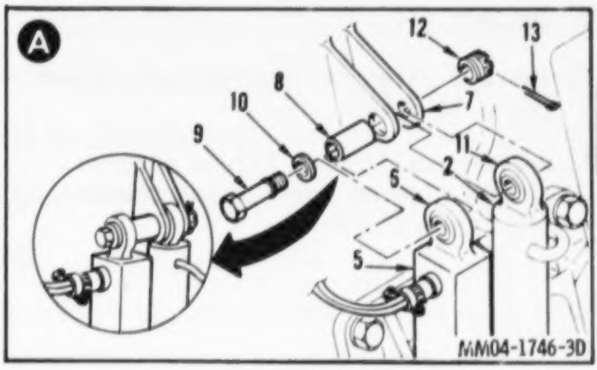
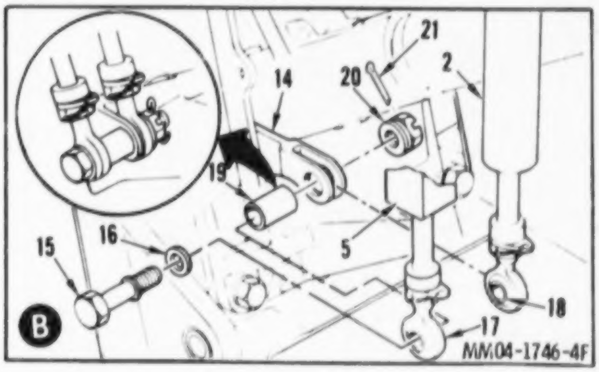
11-4-3. PILOT COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-3





3. **Attach LVDT (2) and potentiometer (5) to bracket (7).**

   a. Aline LVDT (2) and potentiometer (5) with bracket (7).

   b. Insert bolt (9) through washer (10), rod end bearing (6), spacer (8), bracket (7) and rod end bearing (11).

   c. Hold bolt (9) and install nut (12).

   d. Install new cotter pin (13).

4. **Attach LVDT (2) and potentiometer (5) to arm (14).**

   a. Aline LVDT (2) and potentiometer (5) with arm (14).

   b. Insert bolt (15) through washer (16), rod end bearing (17), spacer (19), arm (14) and rod end bearing (18).

   c. Hold bolt (15). Install nut (20).

   d. Install new cotter pin (21).

5. **Install pilot collective stick -3 rig pin** (para 11-6-2).

6. **Adjust LVDT null** (para 11-4-36).

7. **Adjust potentiometer** (para 4-8-60).

8. **Remove pilot collective stick -3 rig pin** (para 11-6-2).

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11-4-3. PILOT COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-3

10. Inspect (TI).

11. Install pilot collective stick cover (para 11-3-54).

12. Perform collective flight control system rigging operational check (TM 55-1520-238-T).

END OF TASK

11-4-4. AUTOMATIC STABILIZATION EQUIPMENT (ASE) PANEL REMOVAL 11-4-4

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

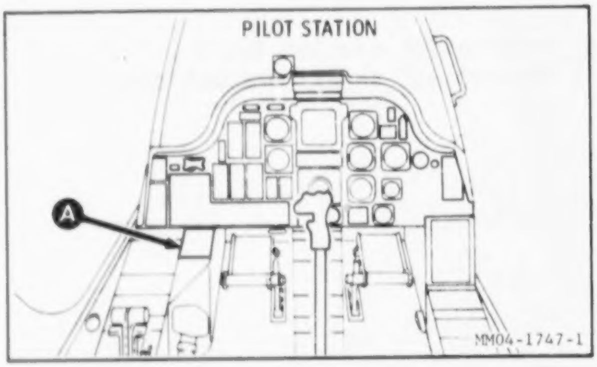
1. Enter pilot station (para 1-7-1). Observe all safety precautions.
2. Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel. Place PNVS to ON.
3. Remove ASE panel (1).
   - a. Unlock four camloc fasteners (2).
   - b. Lift panel (1) straight up until connector (3) is clear of console.
4. Detach connector P170 (3) from connector J1 (4).

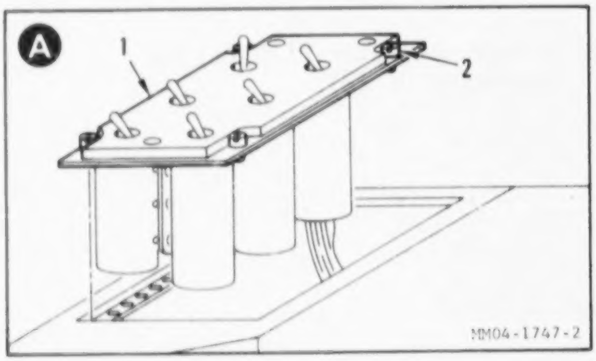
B. CLEANING

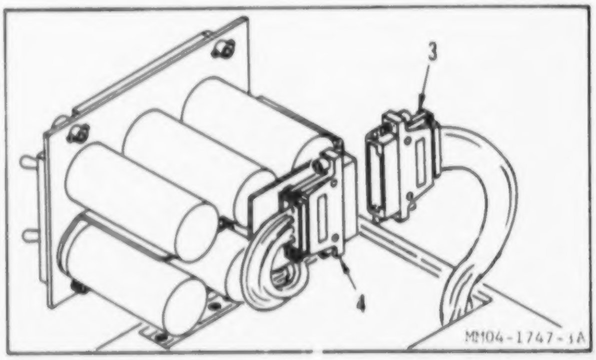
Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check ASE panel assembly and electrical wiring for damage (para 11-4-1).
2. Check ASE panel assembly and electrical wiring for corrosion (para 1-5-38).







END OF TASK

11-4-5. AUTOMATIC STABILIZATION EQUIPMENT (ASE) PANEL INSTALLATION 11-4-5

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

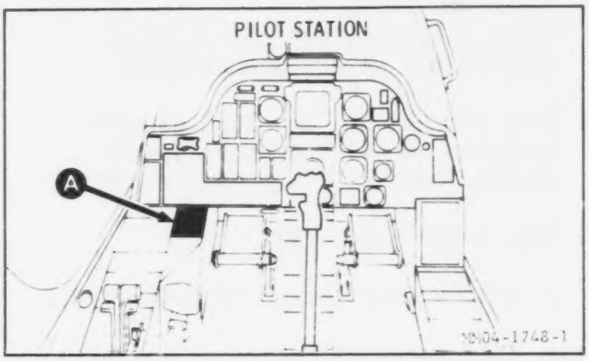
References:

TM 55-1520-238-T

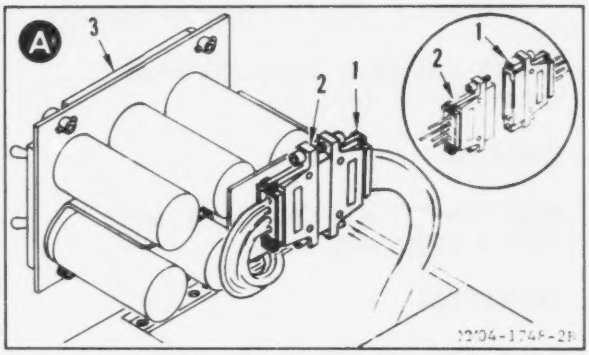
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**



2. **Attach connector P170 (1) to connector J1 (2).**



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11-4-5. AUTOMATIC STABILIZATION EQUIPMENT (ASE) PANEL INSTALLATION (cont) 11-4-5

3. Install ASE panel (3).

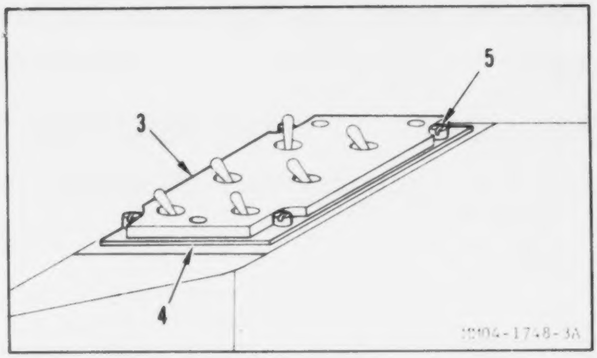
a. Aline ASE panel (3) with mounting holes on console (4).

b. Place PNVS switch in OFF position.

c. Lock four camloc fasteners (5).

4. Inspect (TI).

5. Perform DASE operational check (TM 55-1520-238-T).



END OF TASK

11-4-6. REPLACEMENT OF EDGE LIGHTED PANEL ON ASE PANEL 11-4-6

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Remove edge lighted panel (1) from ASE panel (2).** Remove three screws (3).

B. CLEANING

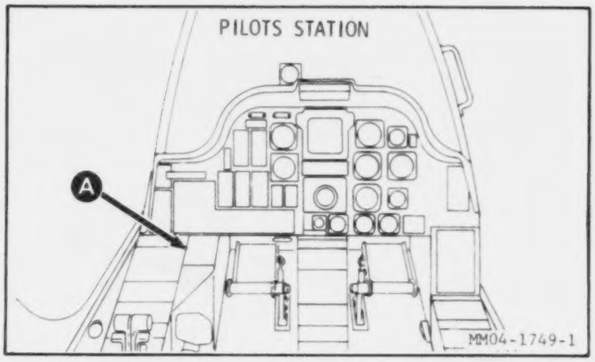
Wipe removed and attaching parts with a clean rag.

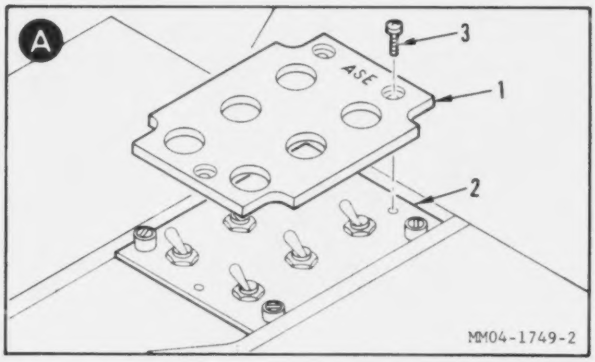
C. INSPECTION

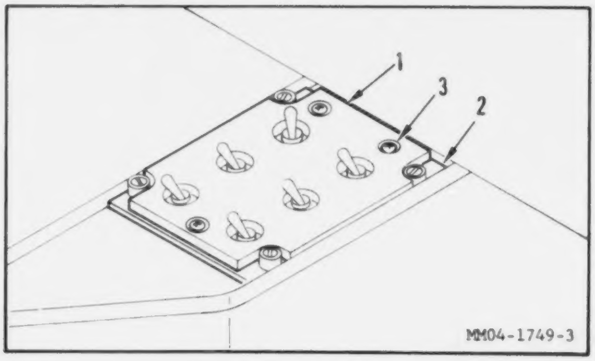
1. **Check edge lighted panel for damage** (para 11-4-1).
2. **Check edge lighted panel attaching parts for corrosion** (para 1-5-38).

D. INSTALLATION

Install edge lighted panel (1) on ASE panel (2). Install three screws (3).







END OF TASK

11-4-7. ASE PANEL SWITCH REPLACEMENT (AVIM) 11-4-7

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-4-4	ASE control panel removed
11-4-6	Edge lighted panel removed

A. REMOVAL

NOTE

The number of wires attached to each switch will differ.

1. **Identify switch to be replaced.**

2. **Unfasten connector and post assembly (1) from ASE Panel (2).**

   a. Remove three screws (3) and washers (4).

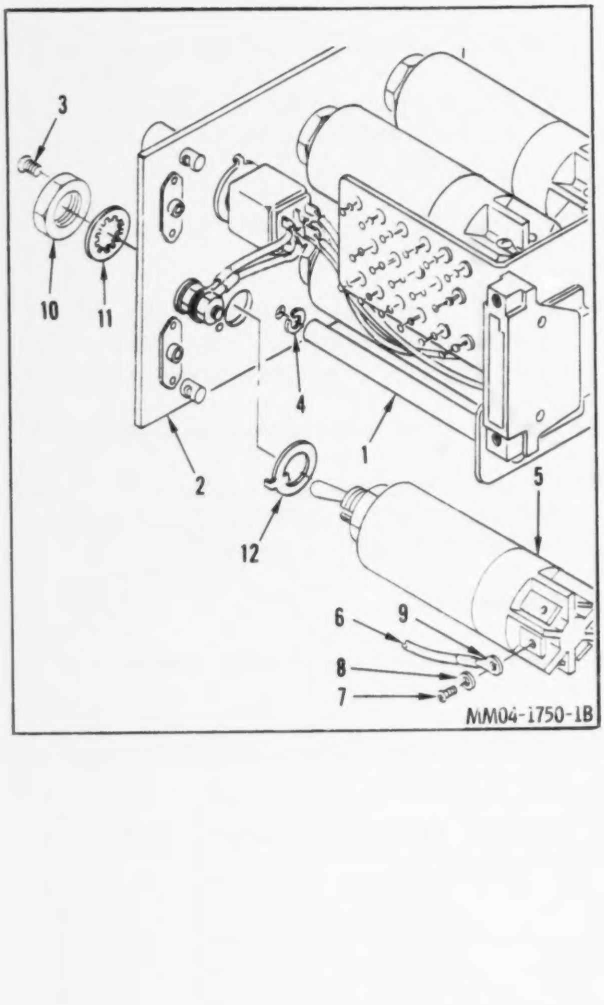
   b. Position connector and post assembly (1) so switch (5) is accessible.

3. **Detach wires (6) from switch (5).**

   a. Identify wires (6) on switch (5).

   b. Remove five screws (7), lock washers (8), and terminal lugs (9).

4. **Remove switch (5) from ASE panel (2).** Remove nut (10), lock washer (11), and lockring (12).



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11-4-7. ASE PANEL SWITCH REPLACEMENT (AVIM) (cont) 11-4-7

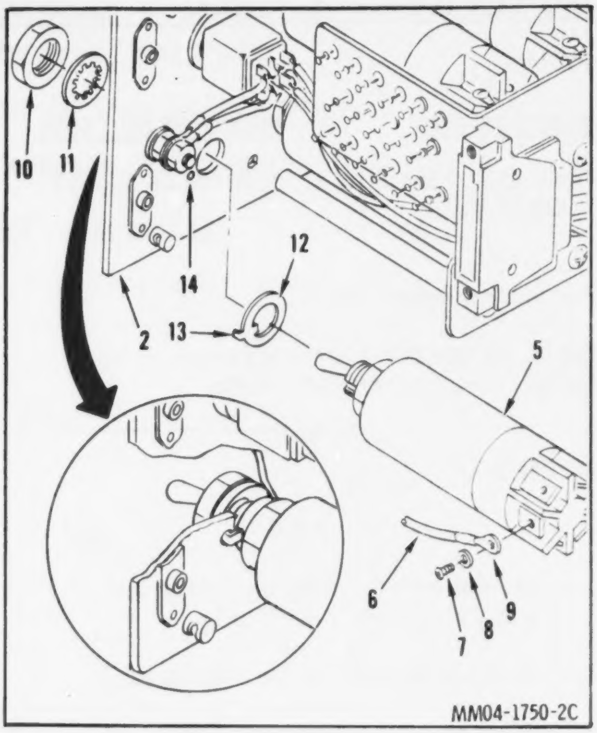
B. CLEANING

Wipe removed and attaching parts with a clean rag.

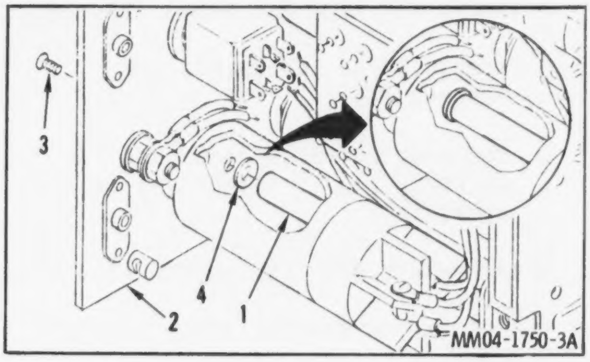
C. INSPECTION

1. **Check switches, ASE panel, and electrical wiring for damage** (para 11-4-1).
2. **Check switches, attaching parts, and electrical wiring for corrosion** (para 1-5-38).

D. INSTALLATION



1. **Install switch (5) on ASE panel (2).**
   a. Insert switch (5) so tab (13) on lockring (12) seats in locator hole (14).
   b. Install lock washer (11) and nut (10).
2. **Attach wires (6) to switch (5).** Install five terminal lugs (9), lock washers (8), and screws (7).



3. **Remove identification from wires.**
4. **Fasten connector and post (1) to ASE panel (2).** Install three lock washers (4) and screws (3).
5. **Inspect (TI).**
6. **Perform DASE operational check** (TM 55-1520-238-T).
7. **Install edge lighted panel** (para 11-4-6).
8. **Install ASE panel** (para 11-4-5).

END OF TASK

11-4-8. BUCS TST SWITCH (ASE PANEL) REPLACEMENT (AVIM) 11-4-8

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Soldering Iron, Electric	3439-00-853-8760

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

References;

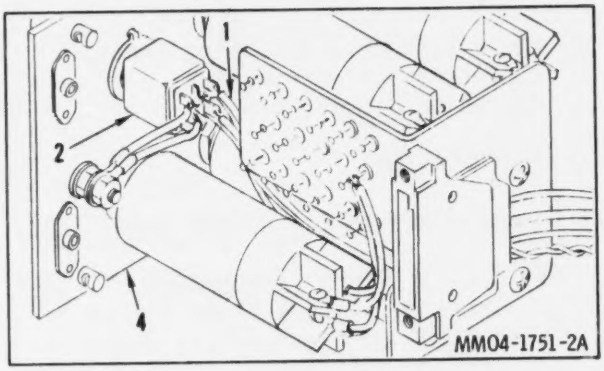
TM 55-1520-238-T

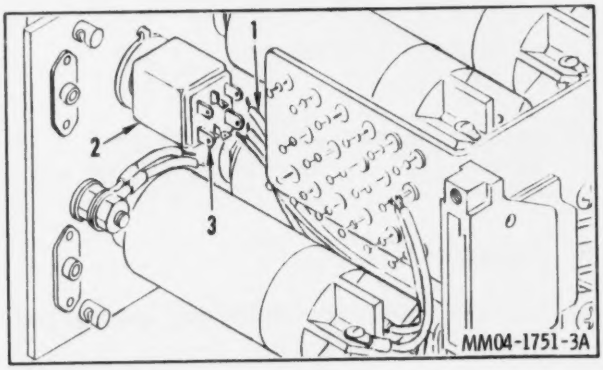
Equipment Conditions

Ref	Condition
1-7-2	Helicopter safed
11-4-6	ASE Edge lighted panel removed
11-4-4	ASE panel removed

A. **REMOVAL**

1. **Detach wires (1) from switch (2).**
   a. Identify wires (1).
   b. Desolder wires (1) from six terminals (3).





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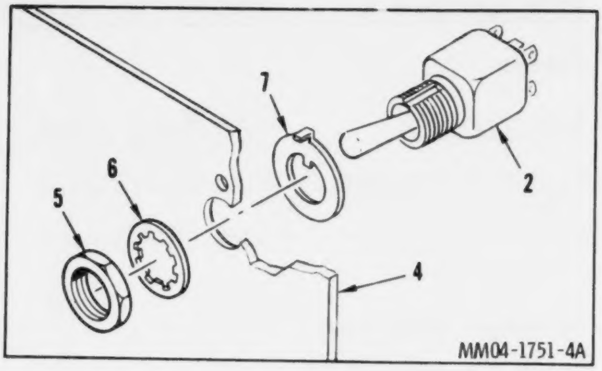
11-4-8. BUCS TST SWITCH (ASE PANEL) REPLACEMENT (AVIM) (cont) 11-4-8



2. Remove switch (2) from ASE panel (4).

a. Remove nut (5), lock washer (6).

b. Remove switch (2) and lockring (7) from panel (4).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check switches, ASE panel, and electrical wiring for damage** (para 11-4-1).

2. **Check switches, attaching parts, and electrical wiring for corrosion** (para 1-5-38).

D. INSTALLATION

1. Install switch (2) on ASE panel (4).

a. Insert switch (2) through lockring (7) and panel (4) so tab (8) on lockring (7) seats in locator hole (9).

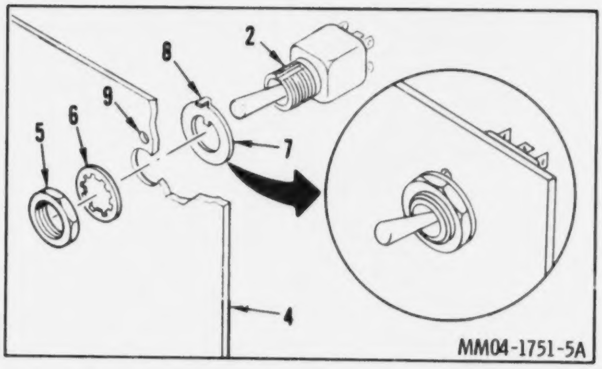
b. Install lock washer (6) and nut (5).

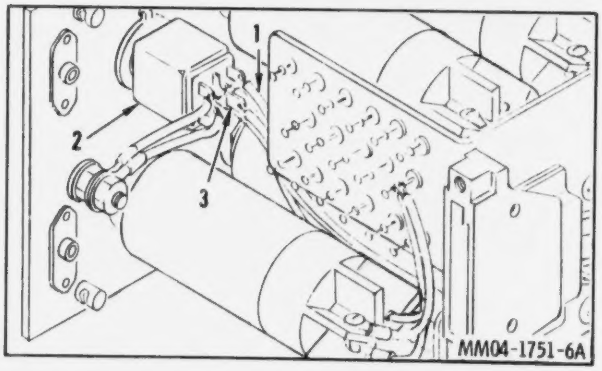
2. **Attach identified wires (1) to switch (2).** Solder wires (1) on six terminals (3).

3. **Inspect (TI).**

4. **Install light-transmitting indicating panel** (para 11-4-6).

5. **Install ASE panel** (para 11-4-5).





END OF TASK

11-4-9. AUTOMATIC STABILIZATION EQUIPMENT (ASE) TRANSFORMER REMOVAL 11-4-9

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Equipment Conditions:

Ref	Condition
1-7-1	Helicopter safed
2-2-2	Access door R295 opened

Personnel Required:

68F10 Aircraft Electrician

A. REMOVAL

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **On pilot center circuit breaker panel, open ASE AC circuit breaker.**
3. **Detach orange wire (1) from ground stud (2).**
4. **Detach red wire (3) and brown wire (4) from terminal board (5).**
5. **Remove ASE transformer (6).** Remove one screw (7) and one washer (8).

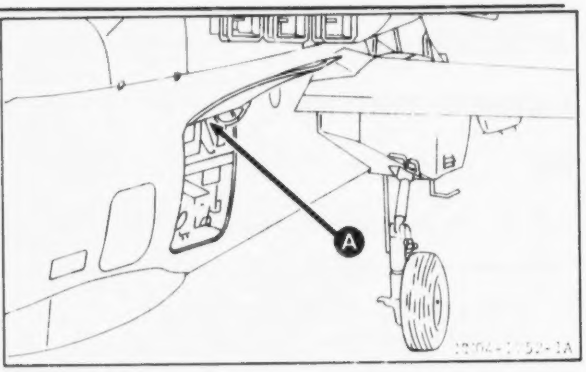
B. CLEANING

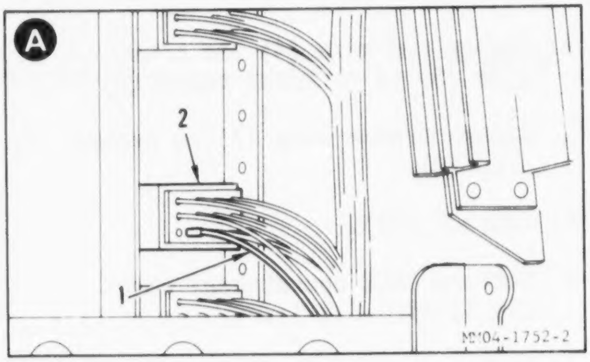
Wipe removed and attaching parts with a clean rag.

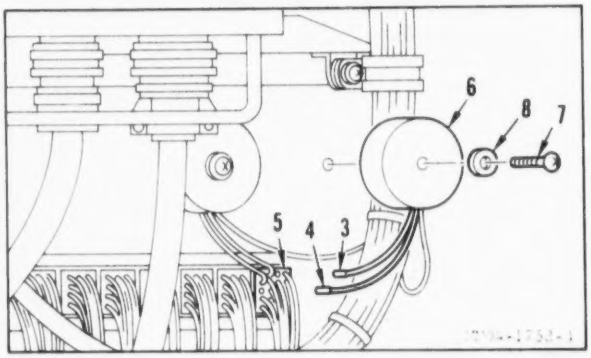
C. INSPECTION

1. **Check transformer, ASE panel, and electrical wiring for damage** (para 11-4-1).
2. **Check transformer, ASE panel, and electrical wiring for corrosion** (para 1-5-38).

END OF TASK







11-4-10. AUTOMATIC STABILIZATION EQUIPMENT (ASE) TRANSFORMER INSTALLATION 11-4-10

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

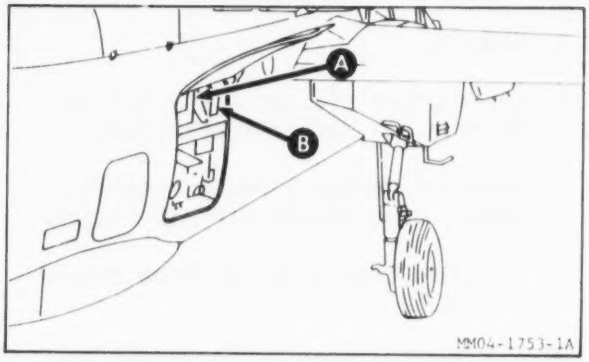
68F10 Aircraft Electrician
66R30 Inspector/Supervisor

References:

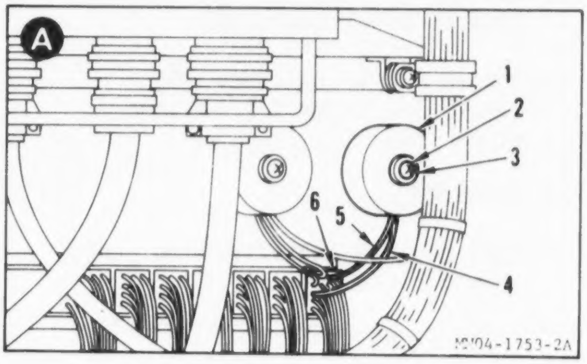
TM 55-1520-238-T

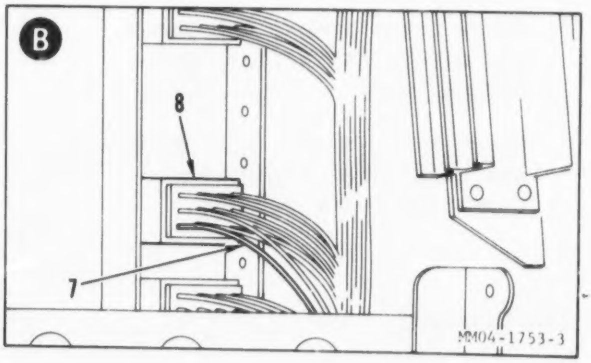
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. **Install ASE transformer (1).** Install washer (3) and screw (2).
2. **Attach red wire (4) and brown wire (5) to terminal board (6).**
3. **Attach orange wire (7) to ground stud (8).**
4. **Inspect (TI).**
5. **Perform DASE operational check** (TM 55-1520-238-T).
6. **Secure access door R295** (para 2-2-2).





END OF TASK

11-4-11. CPG DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-11

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

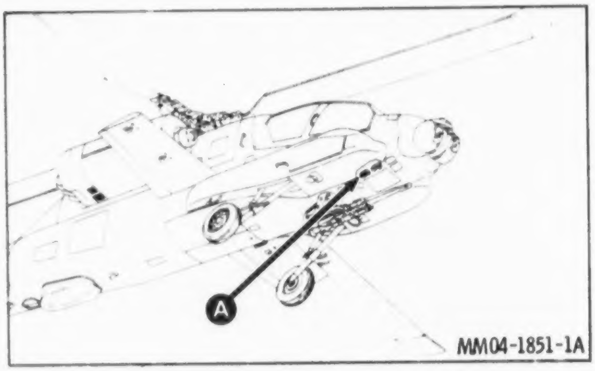
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels B65R and B85R removed

A. REMOVAL

1. Enter pilot compartment (para 1-7-1). Observe all safety precautions.
2. Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.



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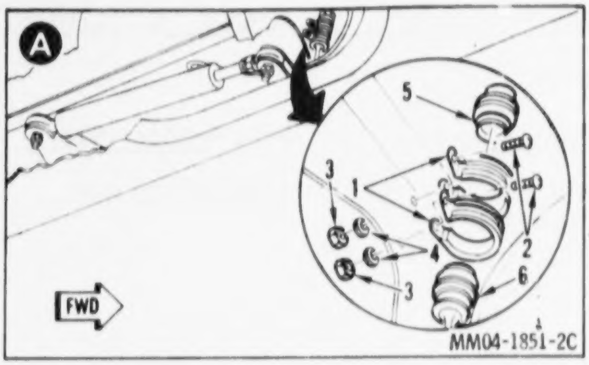
11-4-11. CPG DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-11

3. **Remove two clamps (1).**

   a. Hold two screws (2).

   b. Remove two nuts (3) and two washers (4).

4. **Detach connector P235 (5) from connector J235 (6).**



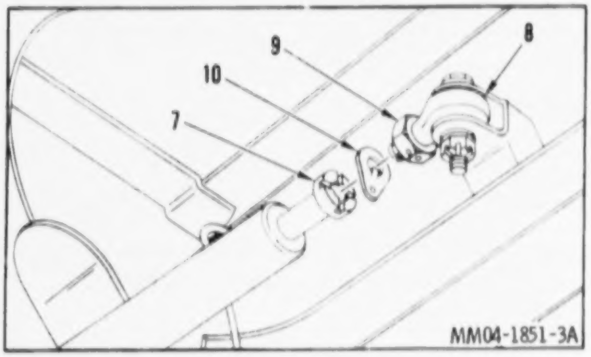
5. **Remove LVDT (7) from rod end bearing (8).**

   a. Remove lockwire.

   b. Loosen nut (9).

   c. Unscrew LVDT (7) from rod end bearing (8).

   d. Remove lock washer (10).

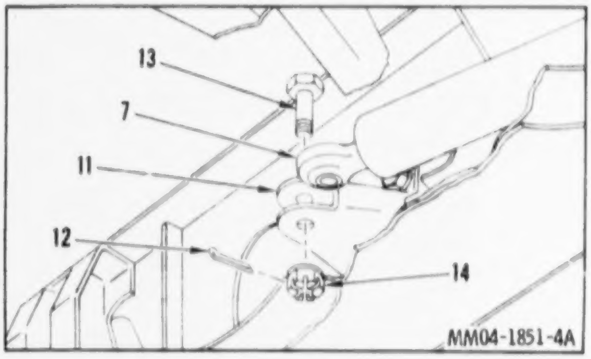


6. **Disconnect LVDT (7) from bracket (11).**

   a. Remove and discard cotter pin (12).

   b. Hold bolt (13). Remove nut (14).

   c. Remove bolt (13).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check LVDT, connectors, attaching parts, and clamp for damage** (para 11-4-1).

2. **Check LVDT, connectors, attaching parts, and clamp for corrosion** (para 1-5-38).

END OF TASK

11-4-12. CPG DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-12

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

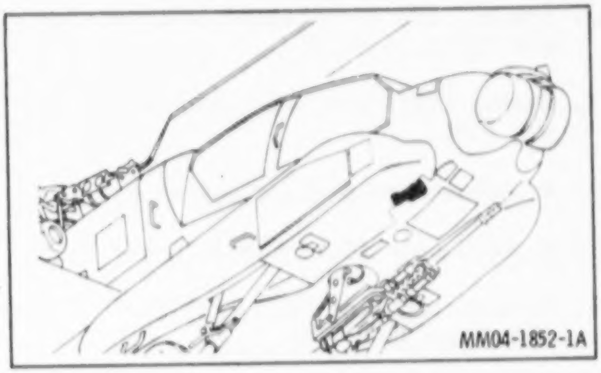
	Cotter Pin (2)
(E29)	Lockwire

Personnel Required:

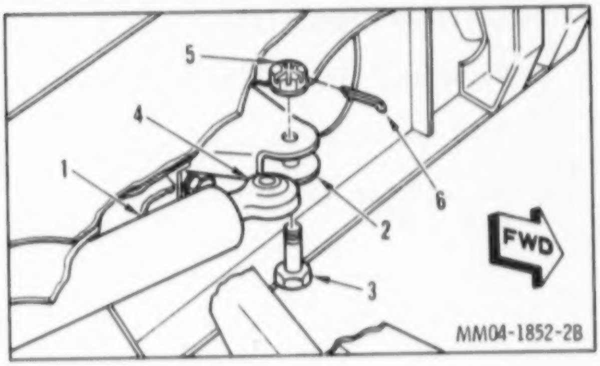
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. **Attach LVDT (1) to bracket (2).**
   a. Aline LVDT (1) with bracket (2).
   b. Insert bolt (3) through bracket (2) and bearing (4) on LVDT (1).
   c. Hold bolt (3). Install nut (5).
   d. Install new cotter pin (6).



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11-4-12. CPG DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-12

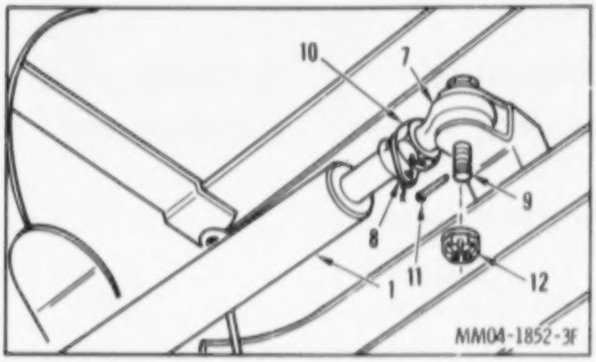
2. **Connect LVDT (1) to rod end bearing (7).**

   a. Position lock washer (8) on bearing (7).

   b. Screw LVDT (1) on bearing (7).

   c. Measure 1.0-inch between center of bearing bolt (9) and lock washer (8).

   d. Tighten nut (10).

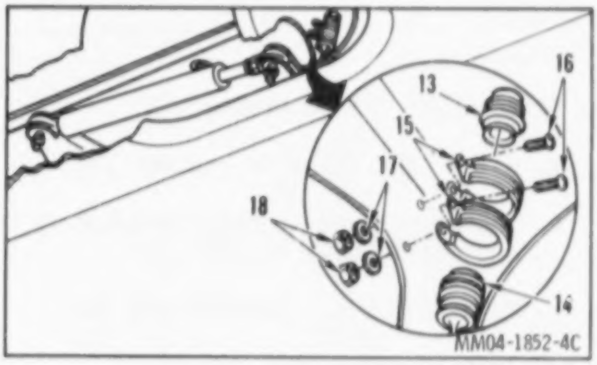


3. **Install CPG directional SPAD -9 rig pin** (para 11-6-14).

4. **Remove LVDT core shaft rod end pivot nut (12).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (9). Remove nut (12).



5. **Attach connector P235 (13) to connector J235 (14).**

6. **Install two clamps (15).**

   a. Aline two clamps (15) with holes.

   b. Hold two screws (16).

   c. Install two washers (17) and nuts (18).

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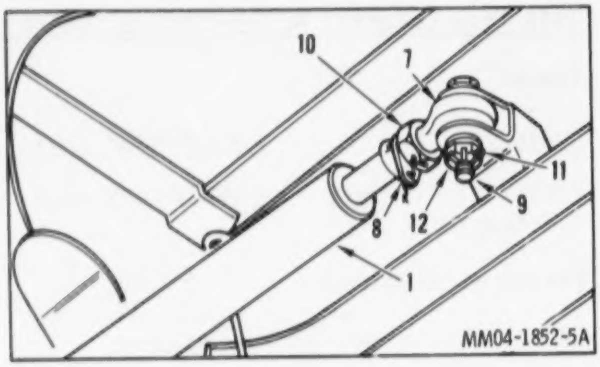
11-4-12. CPG DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-12



7. **Adjust LVDT null** (para 11-4-36).

8. **Secure LVDT.**

   a. Lockwire nut (10) to lock washer (8). Use lockwire (E29).

   b. Hold bolt (9). Install nut (12).

   c. Install new cotter pin (11).

9. **Remove CPG directional SPAD -9 rig pin** (para 11-6-14).

10. **Inspect (TI).**

11. **Perform directional flight control system rigging operational check** (TM 55-1520-238-T).

12. **Secure access panels B65R and B85R** (para 2-2-2).

END OF TASK

11-4-13. CPG LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-13

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Equipment Conditions:

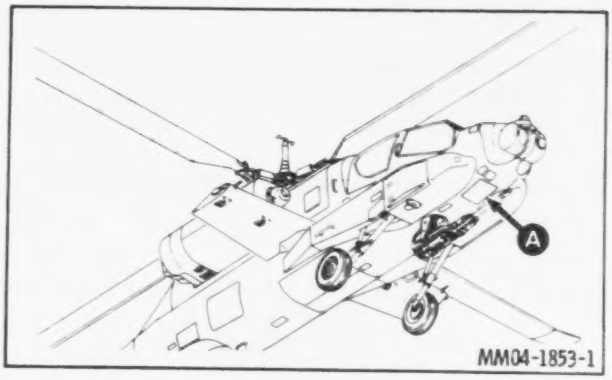
Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors B60 B65L removed

Personnel Required:

67R10 Attack Helicopter Repairer

A. REMOVAL

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**
2. **Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**



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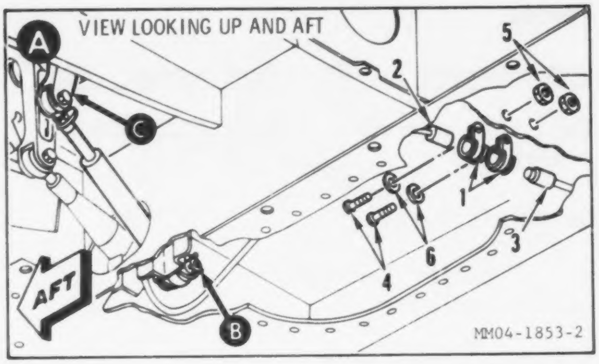
11-4-13. CPG LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-13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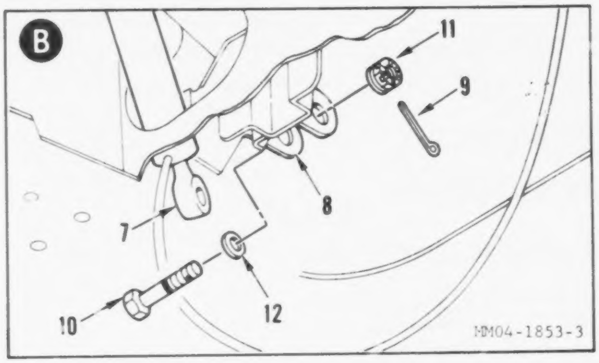
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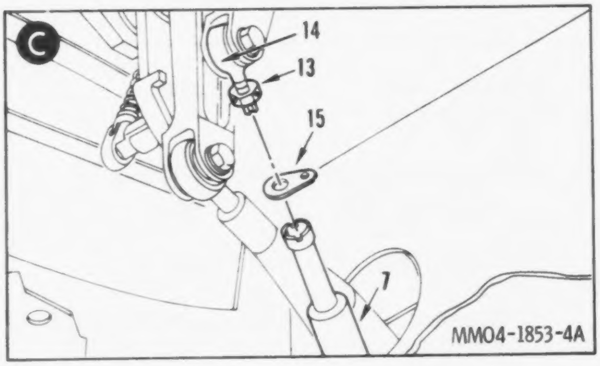
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3. **Remove clamps (1) from connector (2) and connector (3).**

   a. Hold two screws (4).

   b. Remove two nuts (5).

   c. Remove two screws (4) and washers (6).

4. **Detach connector P237 (2) from connector J237 (3).**

5. **Disconnect LVDT (7) from bracket (8).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10) and washer (12).

6. **Remove LVDT (7) from rod end bearing (13).**

   a. Remove lockwire.

   b. Loosen nut (13).

   c. Unscrew LVDT (7) from rod end bearing (14).

   d. Remove lock washer (15).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check LVDT, connector, attaching parts, and clamps for damage** (para 11-4-1).

2. **Check LVDT, connector, attaching parts, and clamps for corrosion** (para 1-5-38).

END OF TASK

11-4-14. CPG LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-14

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)
(E34) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

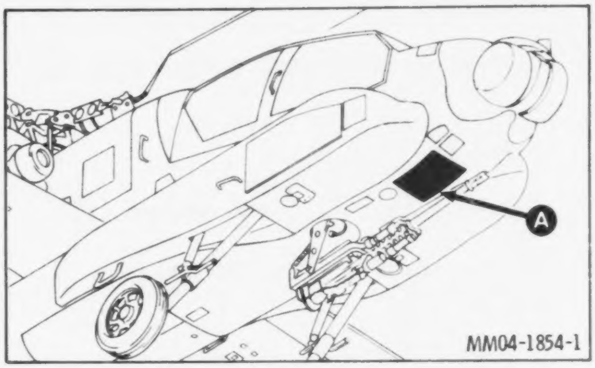
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Connect LVDT (1) to rod end bearing (2).**
   a. Position lock washer (3) on bearing (2).
   b. Screw LVDT (1) onto bearing (2).
   c. Measure 0.90-inch between center of bearing (2) and lock washer (3).
   d. Tighten nut (4).



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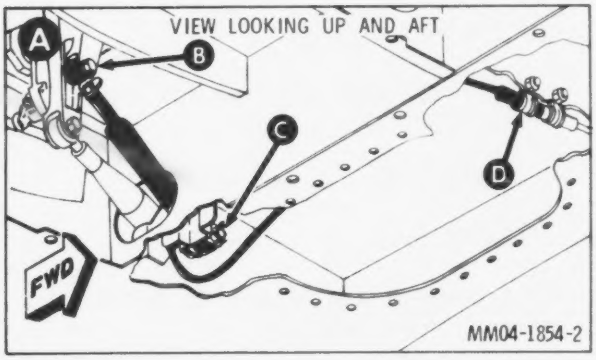

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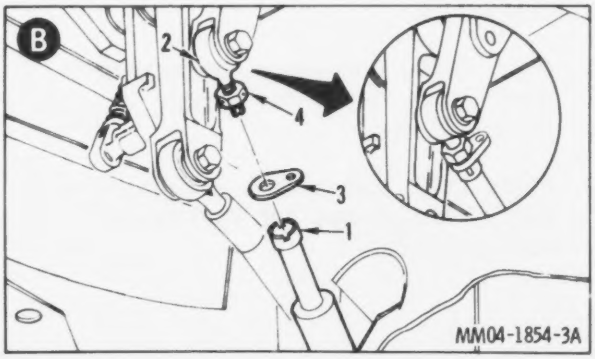

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11-4-14. CPG LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-14

2. **Attach LVDT (1) to bracket (5).**

   a. Aline LVDT (1) to bracket (5).

   b. Insert bolt (6) through washer (7), bracket (5), and bearing (8).

   c. Hold bolt (6). Install nut (9).

   d. Install new cotter pin (10).

3. **Install CPG cyclic stick -5 rig pin** (para 11-6-10).

4. **Remove LVDT core shaft rod end pivot nut (11).**

   a. Remove and discard cotter pin (12).

   b. Hold bolt (13). Remove nut (11).

5. **Attach connector P237 (14) to connector J237 (15).**

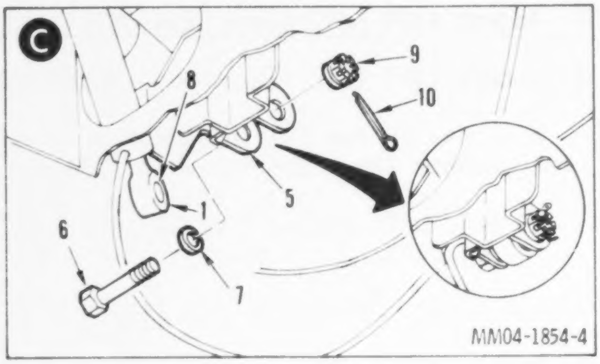
6. **Install clamps (16) on connector (14) and connector (15).**

   a. Install two screws (17) through two washers (18) and clamps (16).

   b. Install two nuts (19) on screws (17).

   c. Hold screws (17).

   d. Tighten nuts (19).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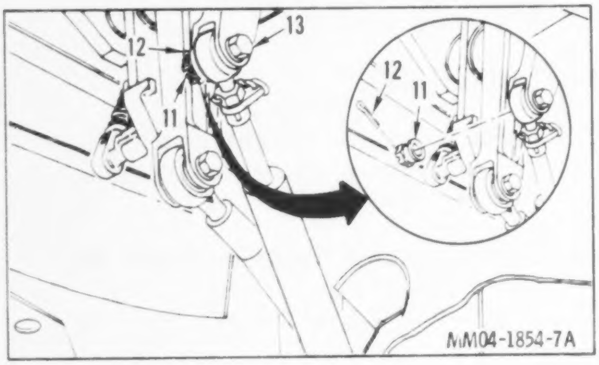
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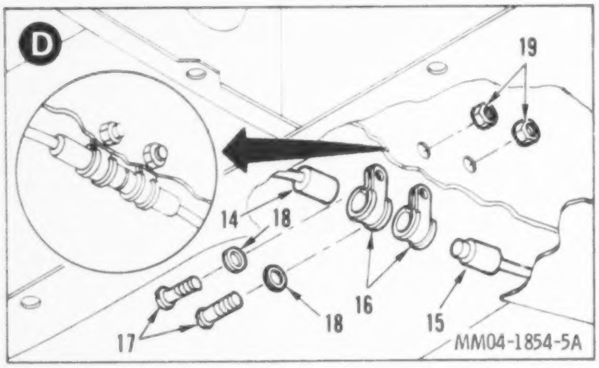
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11-4-14. CPG LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-14

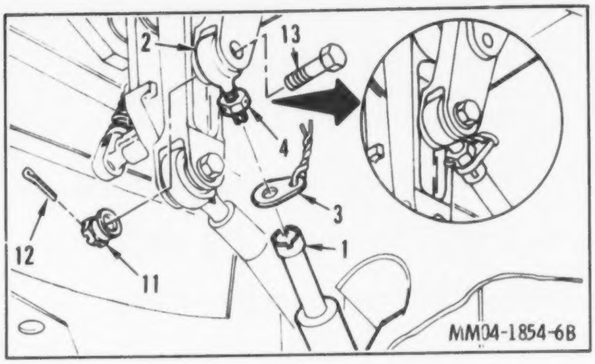
7. **Adjust LVDT null** (para 11-4-36).

8. **Secure LVDT (1).**

   a. Lockwire nut (4) to lock washer (3). Use lockwire (E34).

   b. Hold bolt (13). Install nut (11).

   c. Install new cotter pin (12).



9. **Remove CPG cyclic stick -5 rig pin** (para 11-6-10).

10. **Inspect (TI).**

11. **Perform lateral flight control system rigging operational check** (TM 55-1520-238-T).

12. **Install access doors B65L and B60** (para 2-2-2).

END OF TASK

11-4-15. CPG LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-15

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Equipment Conditions:

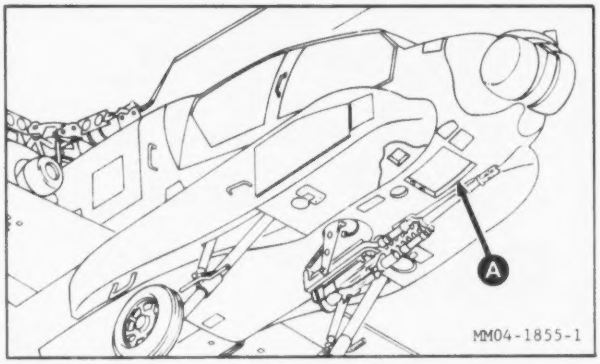
Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access door B75R removed

Personnel Required:

67R10 Attack Helilcopter Repairer

A. REMOVAL

1. Enter pilot station (para 1-7-1). Observe all safety precautions.
2. Open DASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.



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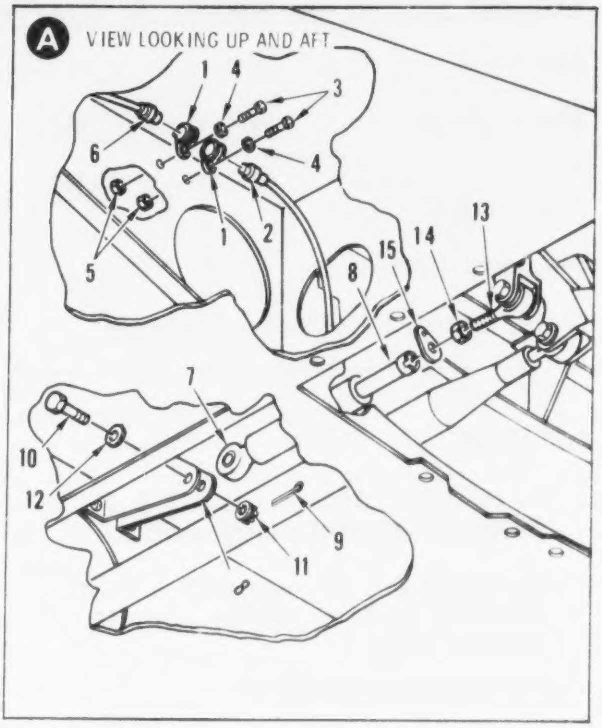
11-4-15. CPG LONGITUDINAL CONTROL POSITION LINEAR VARIALBE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-15



3. **Remove two clamps (1) from connectors (2) and (6).**

   a. Hold two screws (3).

   b. Remove two nuts (5).

   c. Remove two screws (3), two washers (4), and two clamps (1).

4. **Detach connector P273 (2) from connector J273 (6).**

5. **Disconnect LVDT (7) from bracket (8).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10) and washer (12).

6. **Remove LVDT end (8) from rod end bearing (13).**

   a. Remove lockwire.

   b. Loosen nut (14).

   c. Unscrew LVDT end (8) from rod end bearing (13).

   d. Remove lock washer (15).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check LVDT, attaching parts, mounting bracket, and connector for damage** (para 11-4-1).

2. **Check LVDT, attaching parts, mounting bracket, and connector for corrosion** (para 1-5-38).

END OF TASK

11-4-16. CPG LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-16

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

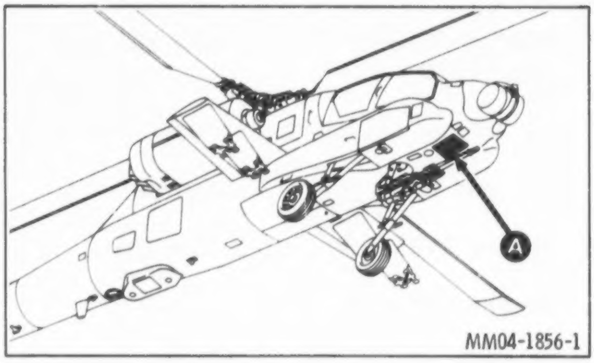
TM 55-1520-238-T

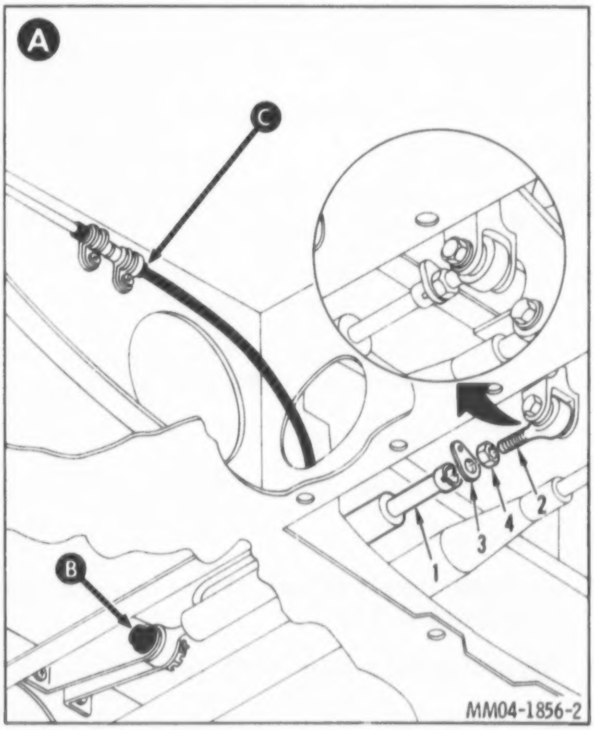
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Connect LVDT (1) to rod end bearing (2).**
   a. Position nut (4) and lock washer (3) on bearing (2).
   b. Screw LVDT (1) on bearing (2).
   c. Measure 1.0-inch between center of bearing (2) and lock washer (3).
   d. Tighten nut (4).





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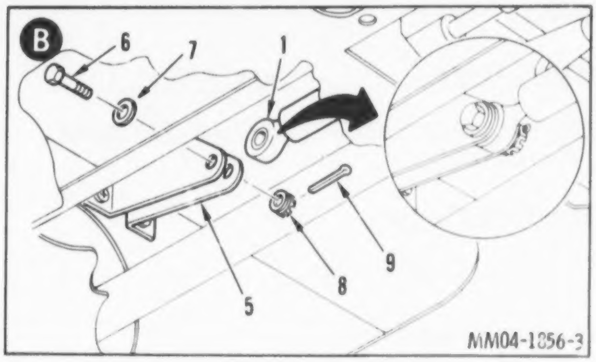
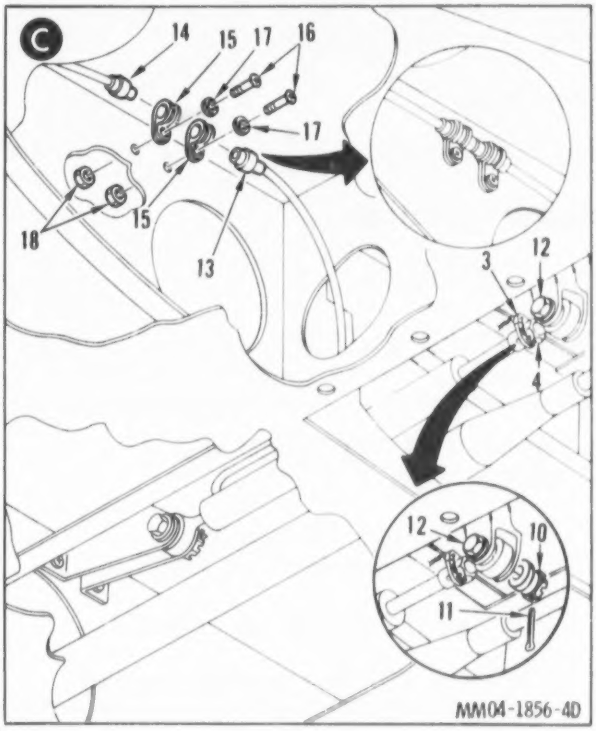
11-4-16. CPG LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-16



2. **Attach LVDT (1) to bracket (5).**
   - a. Aline LVDT (1) with bracket (5).
   - b. Insert bolt (6) through washer (7) and bracket (5) and LVDT (1).
   - c. Hold bolt (6). Install nut (8).
   - d. Install new cotter pin (9).
3. **Install CPG cyclic stick -9 rig pin** (para 11-6-6).



4. **Remove LVDT core shaft rod end pivot nut (10).**
   - a. Remove and discard cotter pin (11)
   - b. Hold bolt (12). Loosen nut (10).
5. **Adjust LVDT null** (para 11-4-36).
6. **Secure LVDT (1).**
   - a. Hold bolt (12). Install nut (10).
   - b. Install new cotter pin (11).
7. **Remove CPG cyclic stick -9 rig pin** (para 11-6-6).
8. **Attach connector P273 (13) to connector J273 (14).**
9. **Install two clamps (15) on connectors (13) and (14).**
   - a. Install two screws (16) through two washers (17) and two clamps (15).
   - b. Hold two screws (16).
   - c. Install two nuts (18).
10. **Inspect (TI).**
11. **Perform longitudinal flight control system rigging operational check** (TM 55-1520-238-T).
12. **Secure access door B75R** (para 2-2-2).

END OF TASK

11-4-17. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-17

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

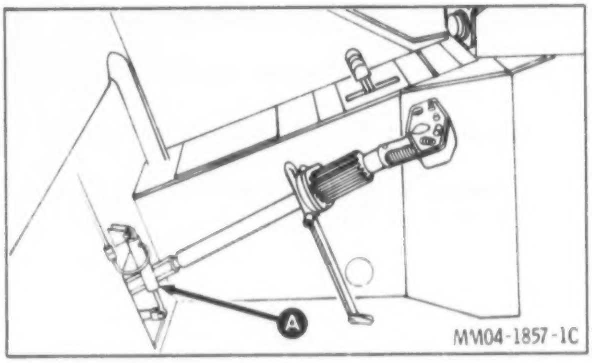
67R10 Attack Helicopter Repairer

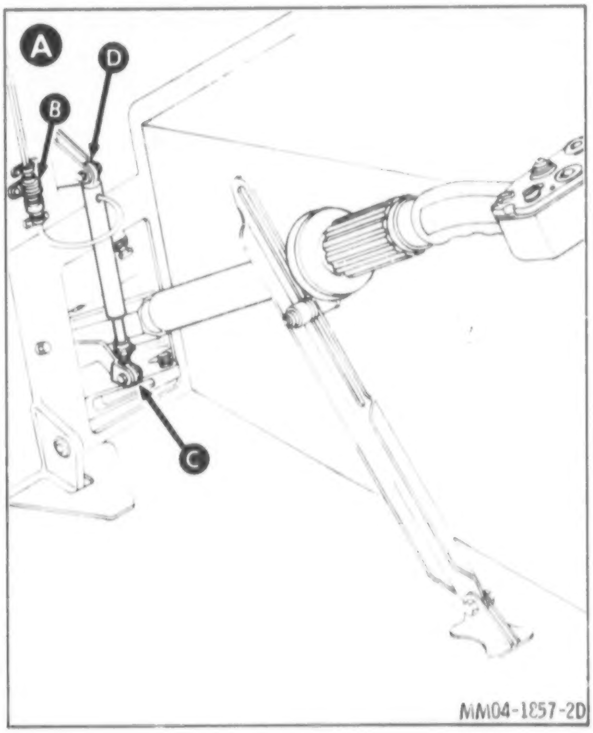
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-54	CPG Collective stick cover removed

A. REMOVAL

1. Enter pilot station (para 1-7-1). Observe all safety precautions.
2. Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.
3. Enter CPG station (para 1-7-1). Observe all safety precautions.





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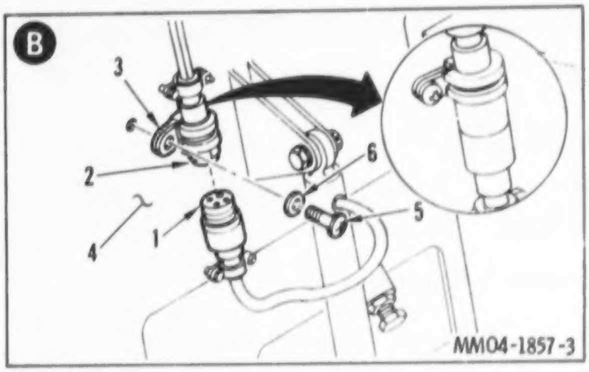
11-4-17. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-17

4. Detach connector P234 (1) from connector J234 (2).

5. Remove clamp (3) from bulkhead (4) by removing screw (5) and washer (6).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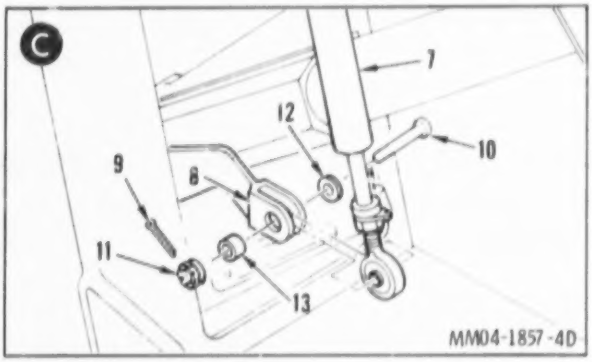
6. Disconnect LVDT (7) from arm (8).

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10), washer (12), and bushing (13).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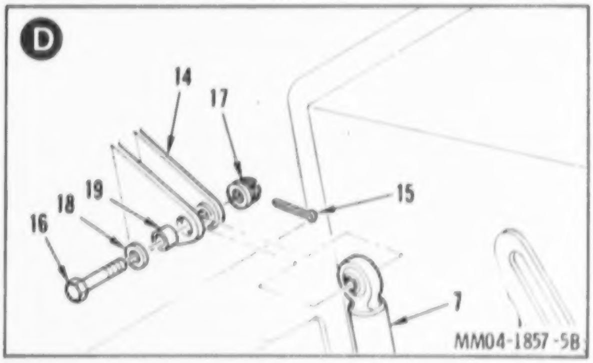
7. Remove LVDT (7) from bracket (14).

   a. Remove and discard cotter pin (15).

   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16), washer (18), and bushing (19).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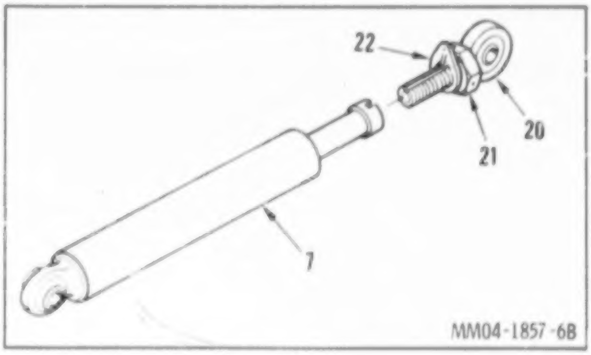
11-4-17. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-17



8. **Remove rod end bearing (20) from LVDT (7).**

   a. Remove lockwire from nut (21) and lock washer (22).

   b. Loosen nut (21).

   c. Unscrew rod end bearing (20) from LVDT (7).

   d. Remove lock washer (22) with rod end bearing (20).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check LVDT, attaching parts, bracket, and connector for damage** (para 11-4-1).

2. **Check LVDT, attaching parts, bracket, and connector for corrosion** (para 1-5-38).

END OF TASK

11-4-18. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-18

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

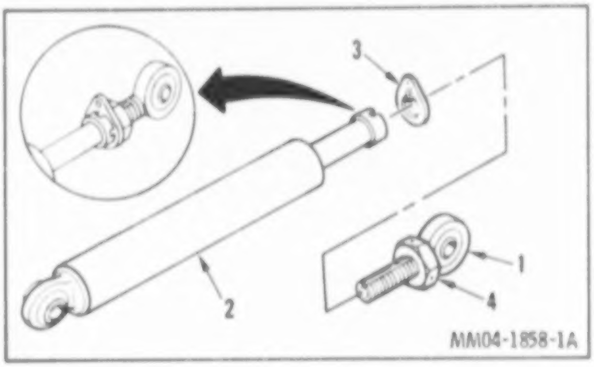
TM 55-1520-238-T

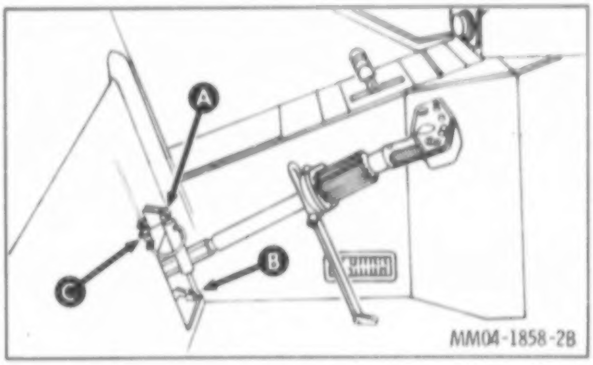
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Attach rod end bearing (1) to LVDT (2).**
   a. Position nut (4) and lock washer (3) on rod end (1).
   b. Screw bearing (1) in LVDT (2).
   c. Measure 1.0-inch between center of hole in bearing (1) and lock washer (3).
   d. Tighten nut (4).
2. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**





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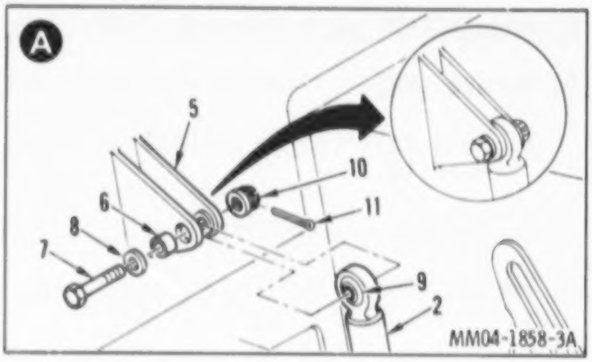
11-4-18. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-18

3. **Attach LVDT (2) to bracket (5).**
   a. Aline LVDT (2) with bracket (5).
   b. Install bushing (6) in bracket (5) and rod end bearing (9).
   c. Install bolt (7) through washer (8), bushing (6), bracket (5), and rod end bearing (9).
   d. Hold bolt (7). Install nut (10).
   e. Install new cotter pin (11).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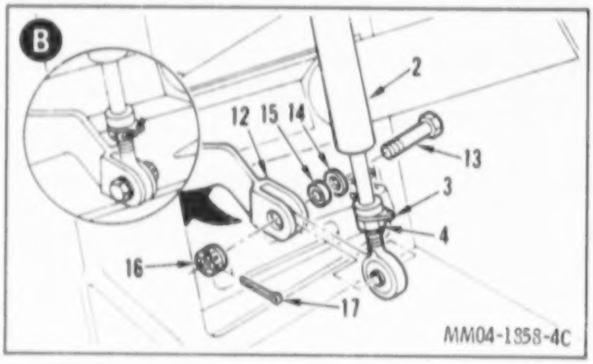
4. **Attach LVDT (2) to arm (12).**
   a. Aline LVDT (2) with arm (12).
   b. Install bushing (15) in arm (12).
   c. Install bolt (13) through washer (14), arm (12), rod end (1), and bushing (15).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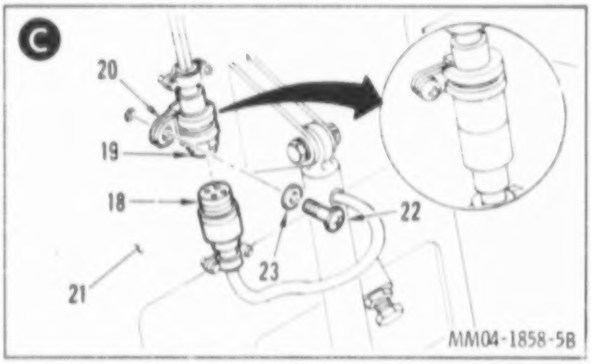
5. **Install CPG collective stick -3 rig pin** (para 11-6-2).
6. **Attach connector P234 (18) to connector J234 (19).**
7. **Install clamp (20) on bulkhead (21).**
   a. Position clamp (20) on bulkhead (21)
   b. Install washer (23) and screw (22).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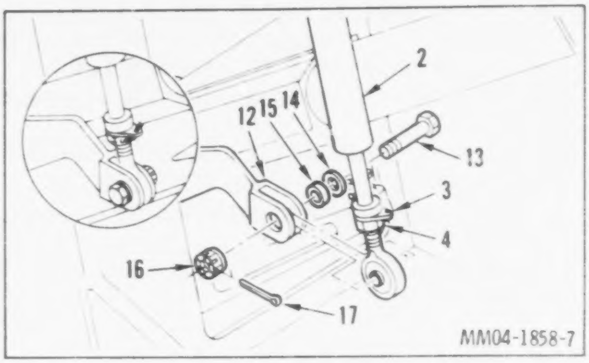
11-4-18. CPG COLLECTIVE CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-18

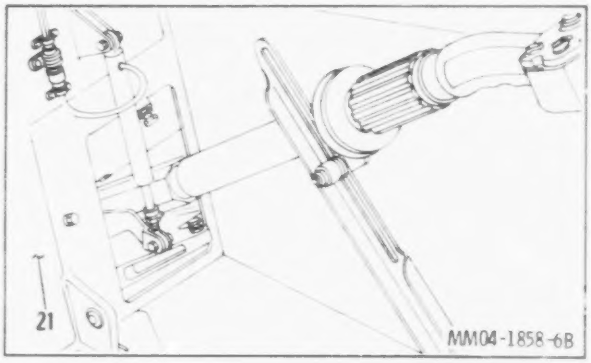
8. Adjust LVDT null (para 11-4-36).

9. Secure LVDT.

   a. Hold bolt (13). Install nut (16).

   b. Install new cotter pin (17).





10. Remove CPG collective stick -3 rig pin (para 11-6-2).

11. Inspect (TI).

12. Perform collective flight control system rigging operational check (TM 55-1520-238-T).

13. Install collective stick cover (para 11-3-54).

END OF TASK

11-4-19. PILOT DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-19

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

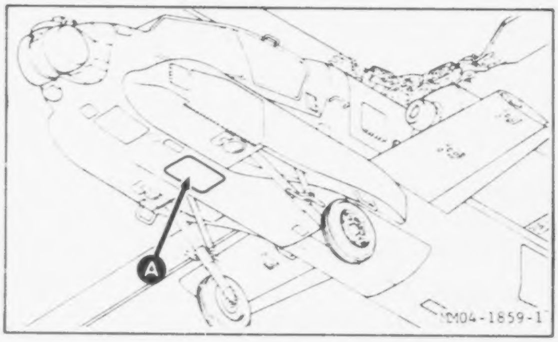
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	30mm aircraft gun removed
TM 9-1090-208-23	Gun turret removed

A. REMOVAL

1. Enter pilot station (para 1-7-1). Observe all safety precautions.

2. Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.



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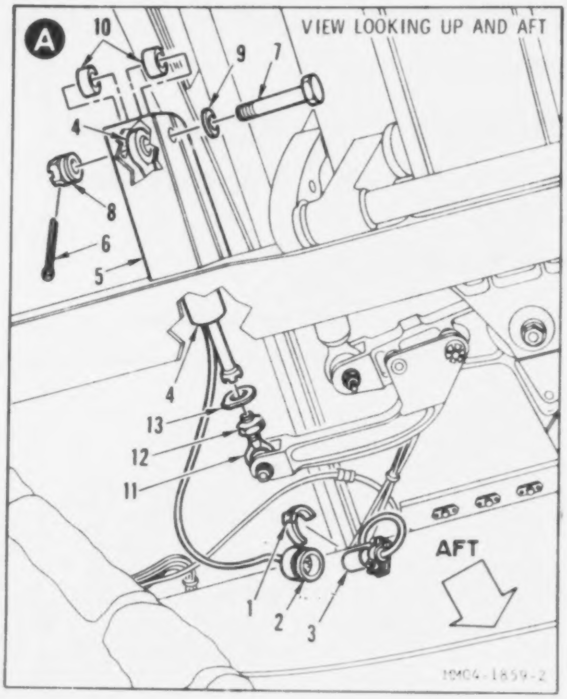
11-4-19. PILOT DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-19



3. **Remove tiedown strap (1).**

4. **Detach connector P231 (2) from connector J231 (3).**

5. **Disconnect LVDT (4) from bracket (5).**

   a. Remove and discard cotter pin (6).

   b. Hold bolt (7). Remove nut (8).

   c. Remove bolt (7), washer (9), and two bushings (10).

6. **Remove LVDT (4) from rod end bearing (11).**

   a. Remove lockwire.

   b. Loosen nut (12).

   c. Unscrew LVDT (4) from rod end (11).

   d. Remove lock washer (13).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check LVDT, attaching parts, bracket, and connector for damage** (para 11-4-1).

2. **Check LVDT, attaching parts, bracket, and connector for corrosion** (para 1-5-38).

END OF TASK

11-4-20. PILOT DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-20

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin (2)
(E106)	Tie Strap
(E8)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

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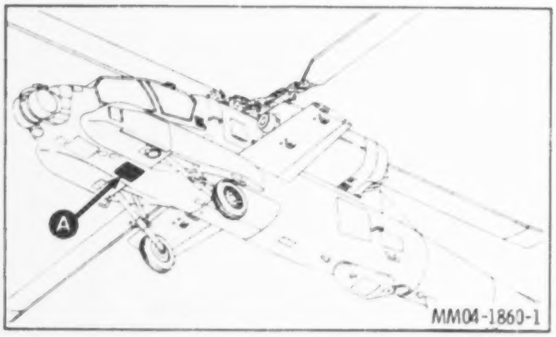
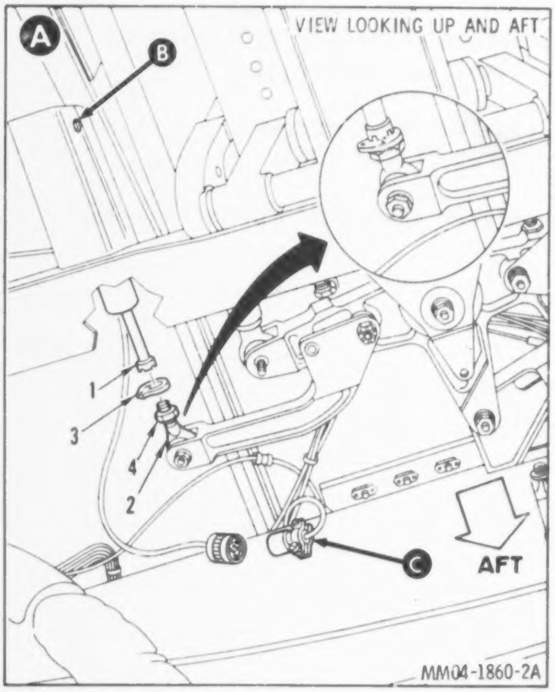
1. **Attach LVDT (1) to rod end bearing (2).**
   - a. Position lock washer (3) on bearing (2).
   - b. Screw LVDT (1) on bearing (2).
   - c. Measure 1.0-inch between center of bearing (2) and lock washer (3).
   - d. Tighten nut (4).





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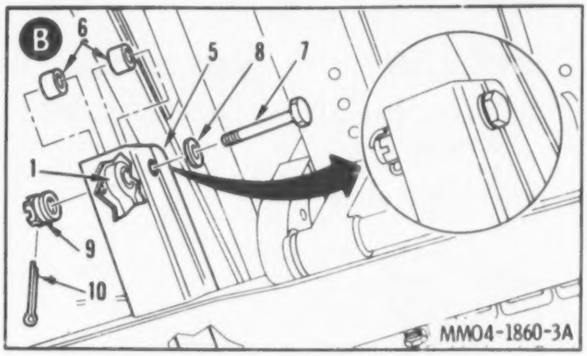
11-4-20. PILOT DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-20



2. Attach LVDT (1) to bracket (5).

a. Aline LVDT (1) with bracket (5).

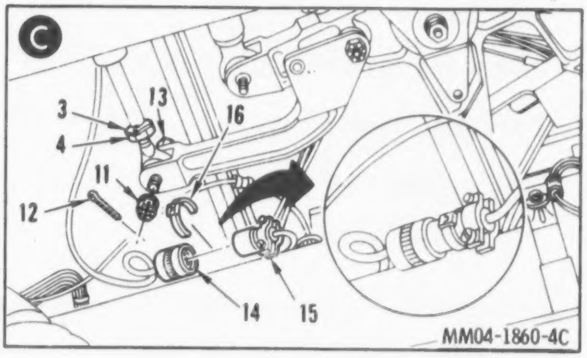
b. Install two bushings (6).

c. Insert bolt (7) through washer (8), bracket (5), two bushings (6), and LVDT (1).

d. Hold bolt (7). Install nut (9).

e. Install new cotter pin (10).

3. Install pilot directional SPAD -9 rig pin (para 11-6-14).



4. Remove LVDT core shaft rod end pivot nut (11).

a. Remove and discard cotter pin (12).

b. Hold bolt (13). Remove nut (11).

5. Attach connector P231 (14) to connector J231 (15).

6. Install new tiedown strap (E106) (16).

7. Adjust LVDT null (para 11-4-36).

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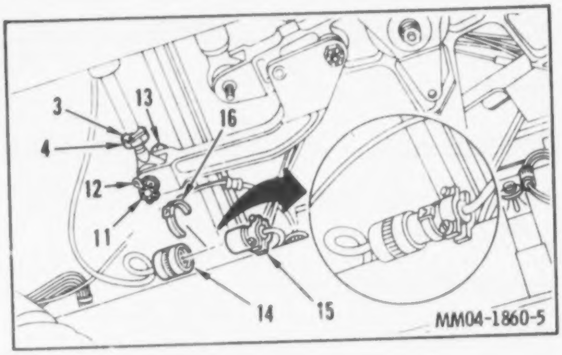
11-4-20. PILOT DIRECTIONAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-20



8. **Secure LVDT adjustment.**

   a. Lockwire nut (4) to lock washer (3). Use lockwire (E8).

   b. Hold bolt (13). Install nut (11).

   c. Install new cotter pin (12).

9. **Remove pilot directional SPAD -9 rig pin** (para 11-6-14).

10. **Inspect (TI).**

11. **Perform directional flight control system rigging operational check** (TM 55-1520-238-T).

12. **Install gun turret** (TM 9-1090-208-23).

13. **Install 30mm aircraft gun** (TM 9-1090-208-23).

END OF TASK

11-4-21. PILOT LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-21

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

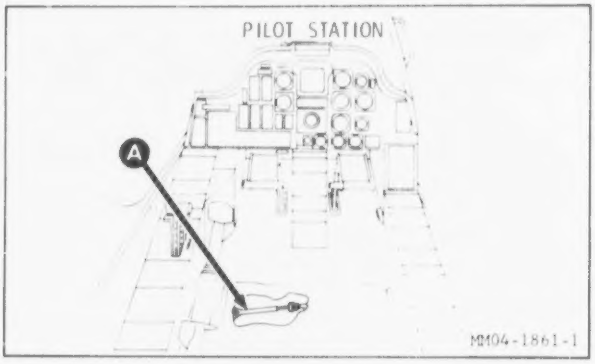
67R10 Attack Helicopter Repairer

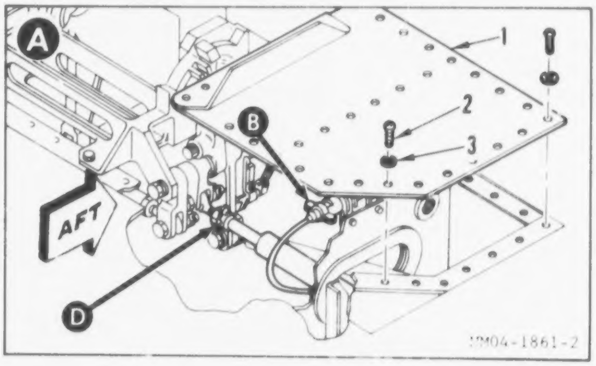
Equipment Conditions:

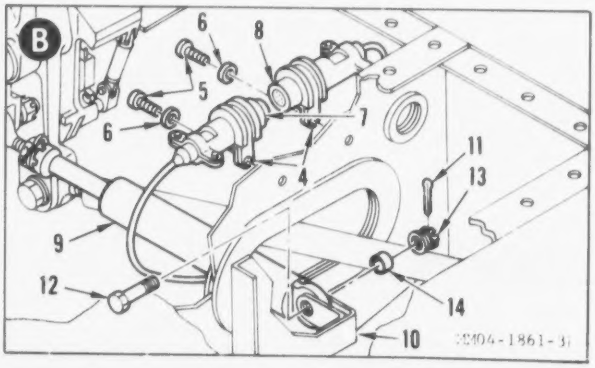
Ref	Condition
1-7-2	Helicopter safed
11-3-29	Pilot cyclic stick housing removed

A. REMOVAL

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**
3. **Remove access cover (1).** Remove 28 screws (2) and washers (3).
4. **Remove two clamps (4).** Remove two screws (5) and two washers (6).
5. **Detach connector P233 (7) from connector J233 (8).**
6. **Remove LVDT (9) from bracket (10).**
   a. Remove and discard cotter pin (11).
   b. Hold bolt (12). Remove nut (13).
   c. Remove bolt (12) and bushing (14).







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11-4-21. PILOT LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-21

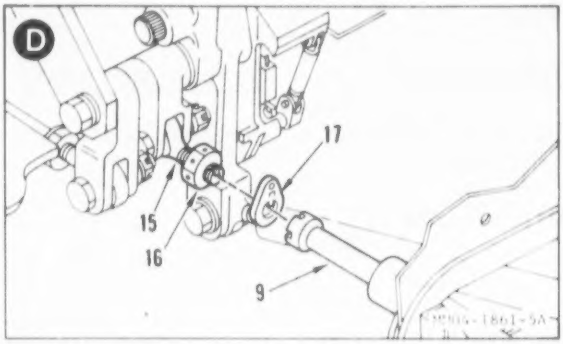
7. **Remove LVDT (9) from rod end (15).**

   a. Remove lockwire.

   b. Loosen nut (16).

   c. Unscrew LVDT (9) from rod end (15).

   d. Remove lock washer (17).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check LVDT, attaching parts, bracket,and connector for damage** (para 11-4-1).

2. **Check LVDT, attaching parts, bracket, and connector for** corrosion (para 1-5-38).

END OF TASK

11-4-22. PILOT LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-22

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

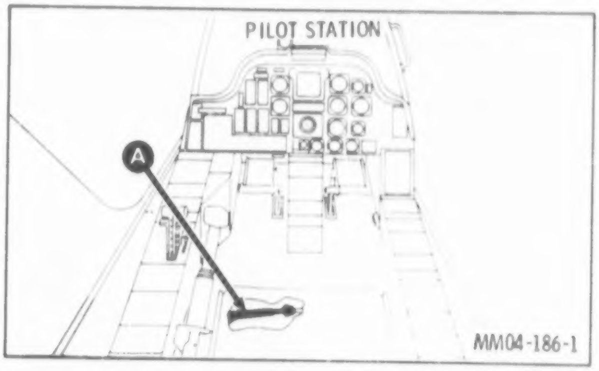
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

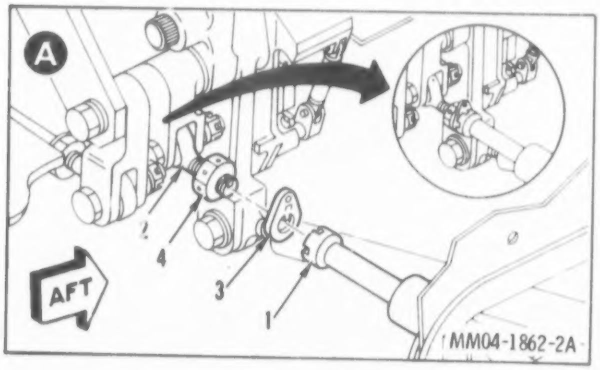
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Attach LVDT (1) to rod end bearing (2).**
   a. Put lock washer (3) on bearing (2).
   b. Screw LVDT (1) on bearing (2).
   c. Measure one-inch between center of bearing (2) and lock washer (3).
   d. Tighten nut (4).

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11-4-22. PILOT LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-22

2. **Attach LVDT (1) to bracket (5).**

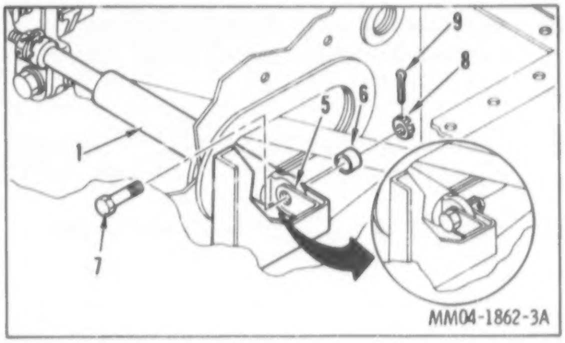
    a. Aline LVDT (1) to bracket (5).

    b. Install bushing (6).

    c. Install bolt (7) through bushing (6) and bracket (5).

    d. Hold bolt (7). Install nut (8).

    e. Install new cotter pin (9).

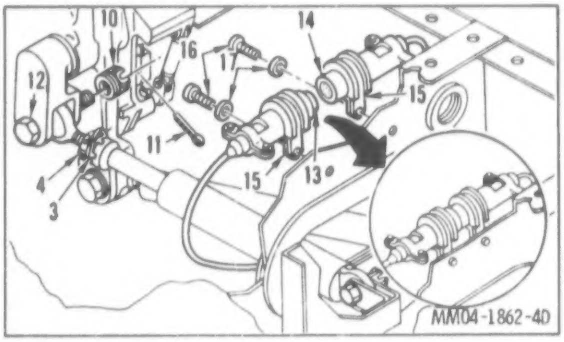


3. **Install pilot cyclic stick -5 rig pin** (para 11-6-10).

4. **Remove LVDT core shaft rod end pivot nut (10).**

    a. Remove and discard cotter pin (11).

    b. Hold bolt (12). Remove nut (10).



5. **Attach connector P233 (13) to connector J233 (14).**

6. **Install two clamps (15).**

    a. Position two clamps (15).

    b. Install two screws (16) through two washers (17) and two clamps (16).

7. **Adjust LVDT null** (para 11-4-36).

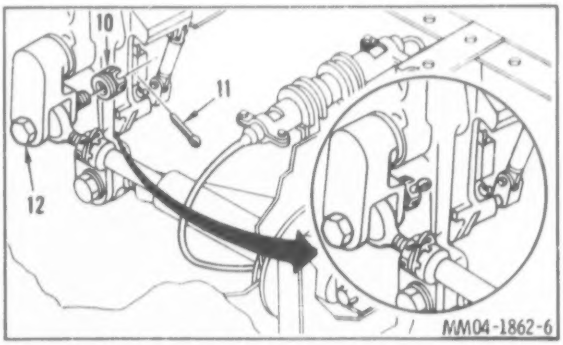
8. **Secure LVDT.**

    a. Hold bolt (12). Install nut (10).

    b. Install new cotter pin (11).

8. **Remove pilot cyclic stick -5 rig pin** (para 11-6-10).

9. **Inspect (TI).**



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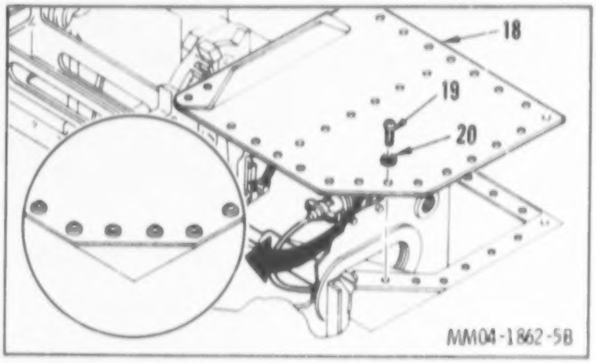
11-4-22. PILOT LATERAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-22

10. **Perform lateral flight control system rigging operational check** (TM 55-1520-238-T).

11. **Install access panel (18).** Install 28 washers (20) and 28 screws (19).

12. **Install pilot cyclic stick cover** (para 11-3-28).



END OF TASK

11-4-23. PILOT LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL 11-4-23

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

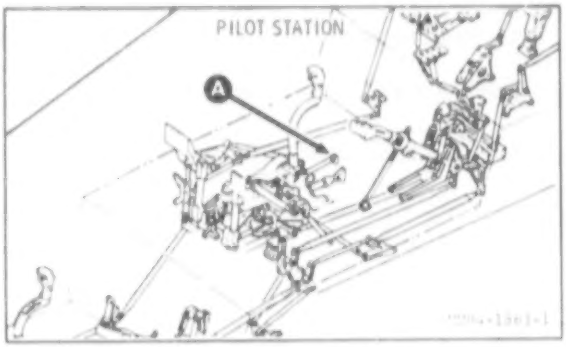
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

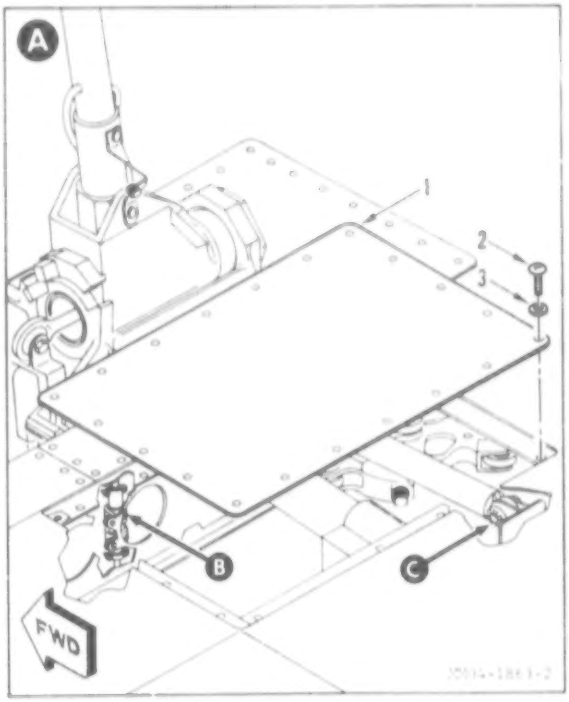
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
2-3-12	Pilot seat removed
2-3-81	Pilot foot guard removed





A. **REMOVAL**

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**

3. **Remove access cover (1).** Remove 20 screws (2) and washers (3).

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11-4-23. PILOT LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) REMOVAL (cont) 11-4-23

4. **Remove two clamps (4).** Remove two screws (5) and washers (6).

5. **Detach connector P232 (7) from connector J232 (8).**

6. **Remove LVDT (9) from bracket (10).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (12). Remove nut (13).

   c. Remove bolt (12).

7. **Remove LVDT (9) from extension (14).**

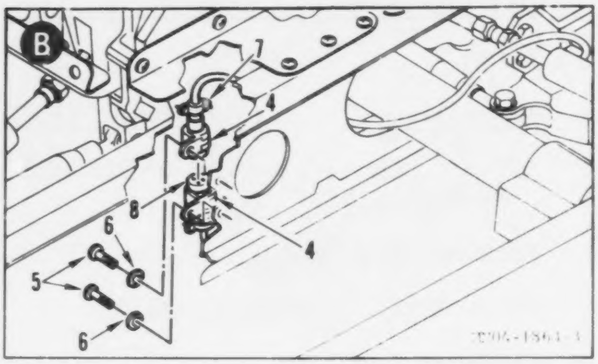
   a. Remove lockwire.

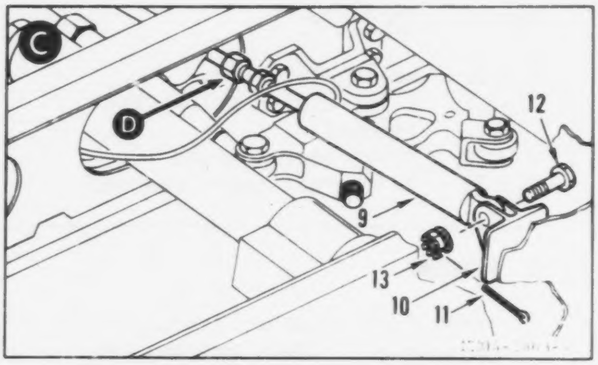
   b. Hold extension (14) at wrench flats (15).

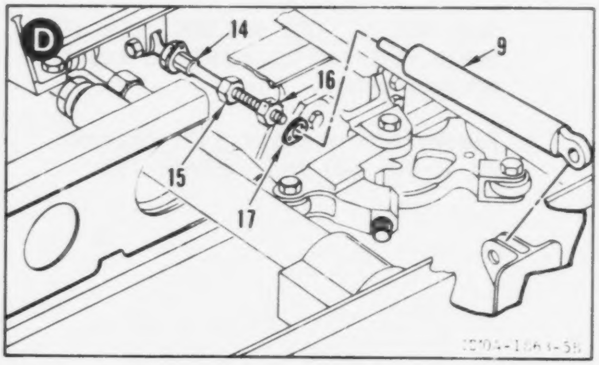
   c. Loosen nut (16).

   d. Unscrew LVDT (9) from extension (14).

   e. Remove lock washer (17).







B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check LVDT, attaching parts, bracket, and connector for damage** (para 11-4-1).

2. **Check LVDT, attaching parts, bracket, and connector for corrosion** (para 1-5-38).

END OF TASK

11-4-24. PILOT LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION 11-4-24

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin
(E34)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

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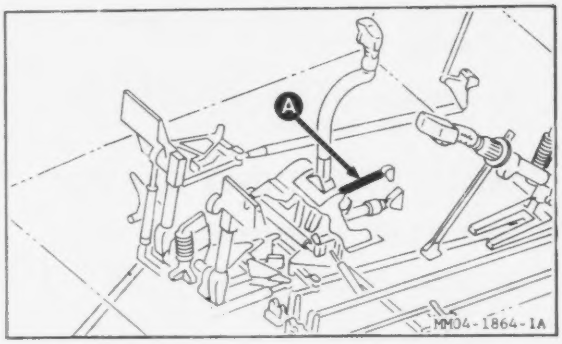
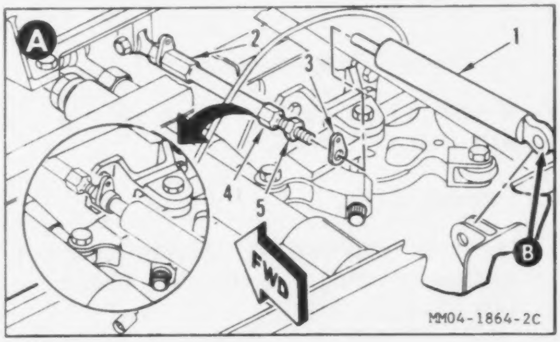
1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Attach LVDT (1) to extension (2).**
   a. Position lock washer (3) on extension (2).
   b. Screw LVDT (1) on extension (2).
   c. Adjust LVDT (1) until forward face of lock washer (3) is 0.60-inch from aft face of extension wrench flats (4).
   d. Hold extension (2) wrench flats (4).
   e. Tighten nut (5).





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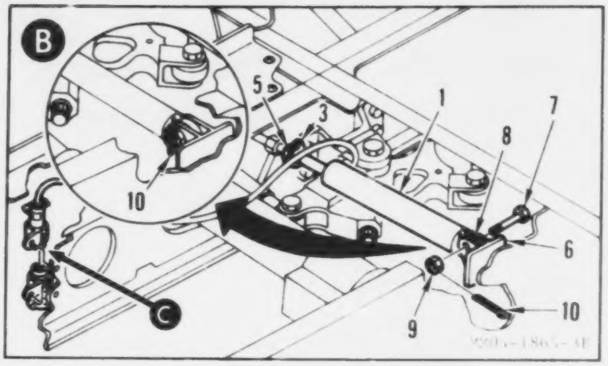
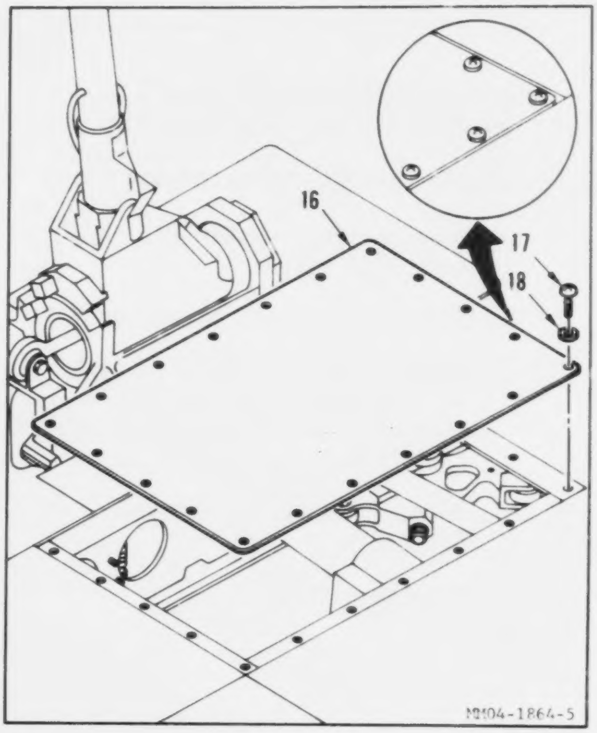
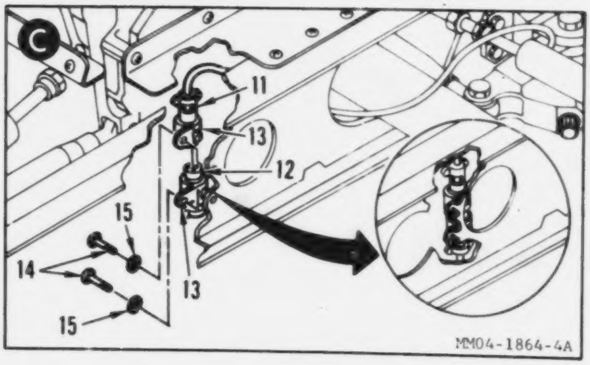
11-4-24. PILOT LONGITUDINAL CONTROL POSITION LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) INSTALLATION (cont) 11-4-24

3. **Attach LVDT (1) to bracket (6).**
   a. Aline LVDT (1) with bracket (6).
   b. Insert bolt (7) through bracket (6) and rod end bearing (8) on LVDT (1).
4. **Install pilot cyclic stick -9 rig pin** (para 11-6-6).
5. **Attach connector P232 (11) to connector J232 (12).**
6. **Install two clamps (13) on connectors (11) and (12).**
   a. Aline two clamps (13) with screw holes.
   b. Install two washers (15) and two screws (14).
7. **Adjust LVDT null** (para 11-4-36).
8. **Secure LVDT adjustment.**
   a. Lockwire nut (5) to lock washer (3). Use lockwire (E34).
   b. Hold bolt (7). Install nut (9).
   c. Install new cotter pin (10).
9. **Remove pilot cyclic stick -9 rig pin** (para 11-6-6).
10. **Inspect (TI).**
11. **Perform longitudinal flight control system rigging operational check** (TM 55-1520-238-T).
12. **Install access panel (16).** Install 20 washers (18) and 20 screws (17).
13. **Install pilot seat** (para 2-3-12).
14. **Install pilot cyclic stick cover** (para 11-3-28).
15. **Install foot guard** (para 2-3-81).

END OF TASK







11-4-25. STABILATOR ACTUATOR REMOVAL/INSTALLATION 11-4-25

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control Systems	1730-01-240-1577
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (2)

Personnel Required:

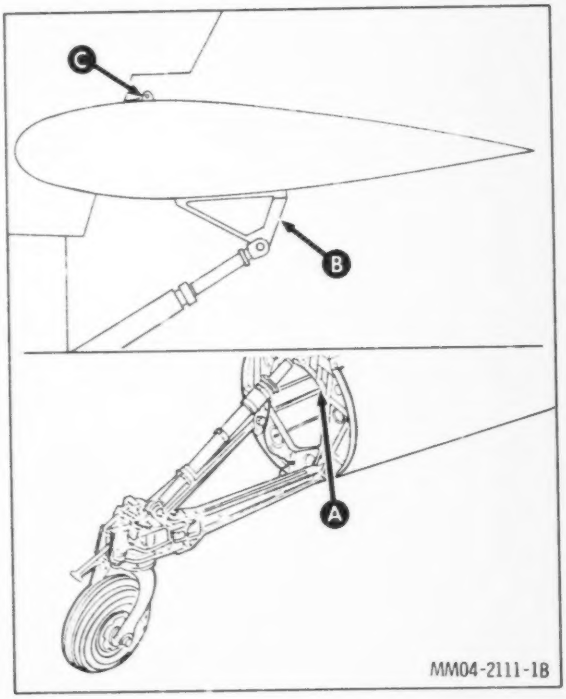
67R10	Attack Helicopter Repairer (3) Two to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers L545 and R545 removed



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11-4-25. STABILATOR ACTUATOR REMOVAL/INSTALLATION (cont) 11-4-25

A. REMOVAL

1. **Detach connector P995 (1) from connector J995 (2).**

2. **Detach connector P996 (3) from connector J996 (4).**

3. **Hold stabilator (5) in place to take weight off actuator (7).** One person support on each side.

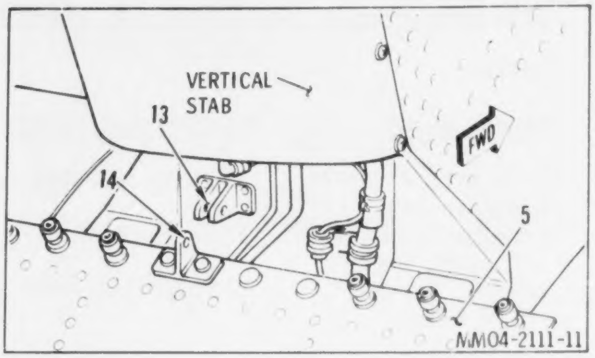
4. **Disconnect actuator (7) from stabilator fitting (6).**

    a. Remove and discard cotter pin (8).

    b. Hold bolt (9).

    c. Remove nut (10).

    d. Remove bolt (9), washer (11), and bushing (12).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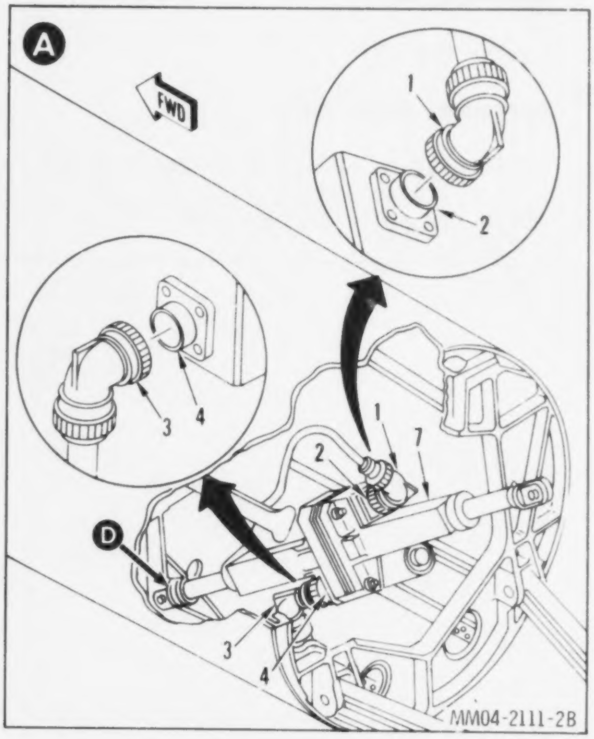
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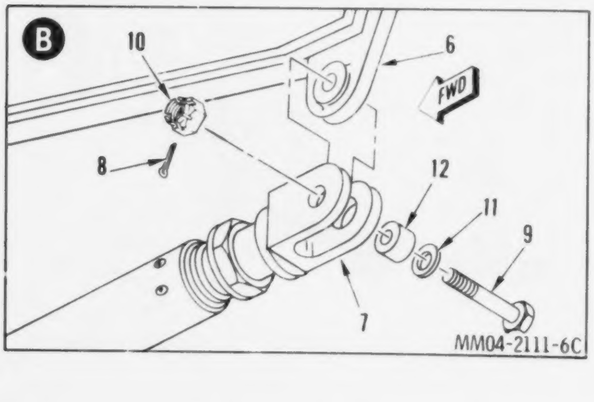
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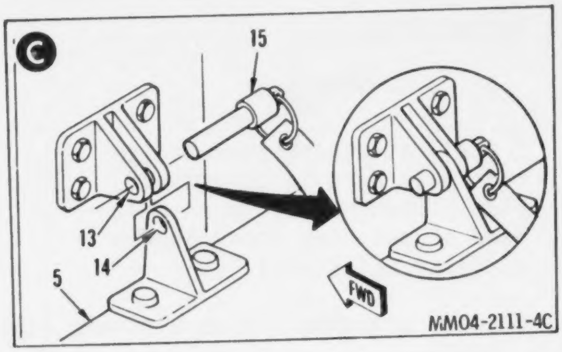

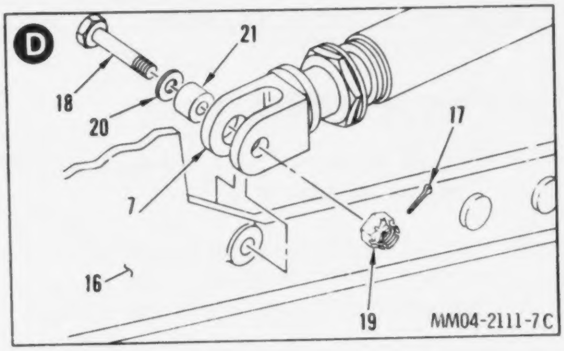

5. **Lock stabilator (5) in up position.**

   a. Move stabilator (5) up until rig pin holes (13) and (14) are alined.

   b. Install rig pin (15) in alined holes (13) and (14). Use control systems rigging kit.

6. **Disconnect actuator (7) from airframe (16).**

   a. Remove and discard cotter pin (17).

   b. Hold bolt (18). Remove nut (19).

   c. Remove bolt (18), washer (20), and bushing (21).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check all removed and attaching parts for damage** (para 11-4-1).

2. **Check for potting compound between backshell and wires of connectors** (TM 55-1500-323-24).

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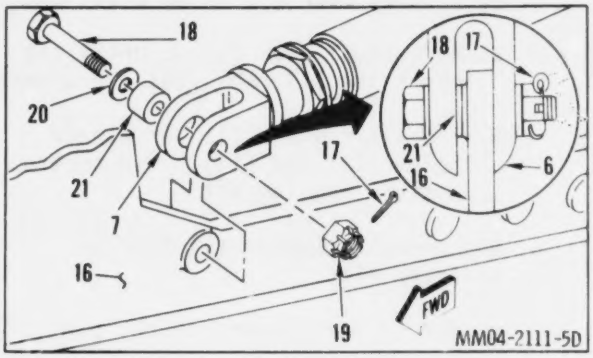
11-4-25. STABILATOR ACTUATOR REMOVAL/INSTALLATION (cont) 11-4-25



D. INSTALLATION

NOTE

Install attaching hardware so that bolt head is on inboard side. Bushing may be on bolt head or nut side depending on actuator adjustment.

1. **Connect actuator (7) to airframe (16).**
   a. Aline actuator (7) with airframe (16).
   b. Position bushing (21).
   c. Insert bushing (21) through inboard side of actuator (7).
   d. Install bolt (18) through washer (20), inboard side of actuator (7) and airframe (16).
   e. Install nut (19) on bolt (18).
2. **Torque nut (19) to 95 to 110 INCH-POUNDS.**
   a. Hold bolt (18).
   b. Torque nut (19) to **95 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **110 INCH-POUNDS.**
   d. Install new cotter pin (17).

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3. Remove rigging pin (15) from stabilator (5).

a. One person support stabilator (5) on each side. Remove pin (15).

b. Hold stabilator (5) horizontal.

NOTE

Install attaching hardware so that bolt head is on inboard side. Bushing may be on bolt head or nut side depending on actuator adjustment.

4. Connect actuator (7) to stabilator (6) fitting.

a. Aline actuator (7) with stabilator (6).

b. Install bushing (12) in inboard side of actuator (7).

c. Insert bolt (9) through washer (11), bushing (12) and inboard side of actuator (7).

d. Install nut (10) on bolt (9).

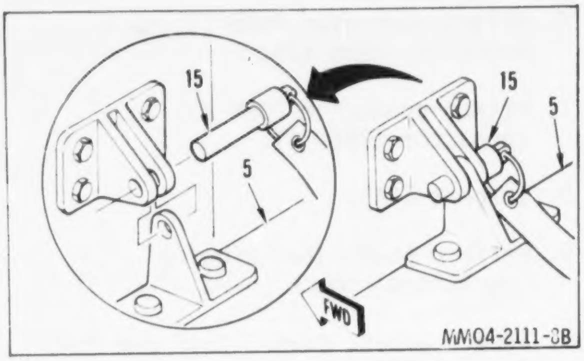
5. Torque nut (9) 95 to 110 INCH-POUNDS.

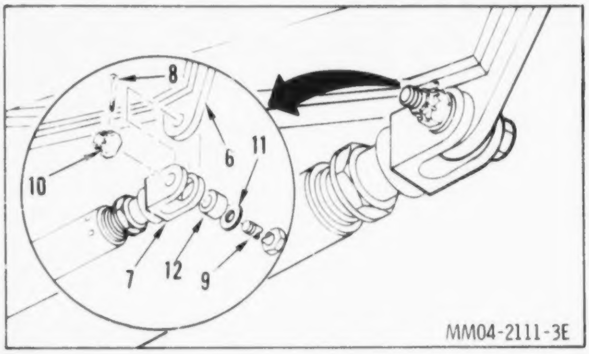
a. Hold bolt (9).

b. Torque nut (10) to **95 INCH-POUNDS.**

c. Increase torque to aline cotter pin holes, but do not exceed **110 INCH-POUNDS.**

d. Install new cotter pin (8).





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11-4-25. STABILATOR ACTUATOR REMOVAL/INSTALLATION (cont) 11-4-25

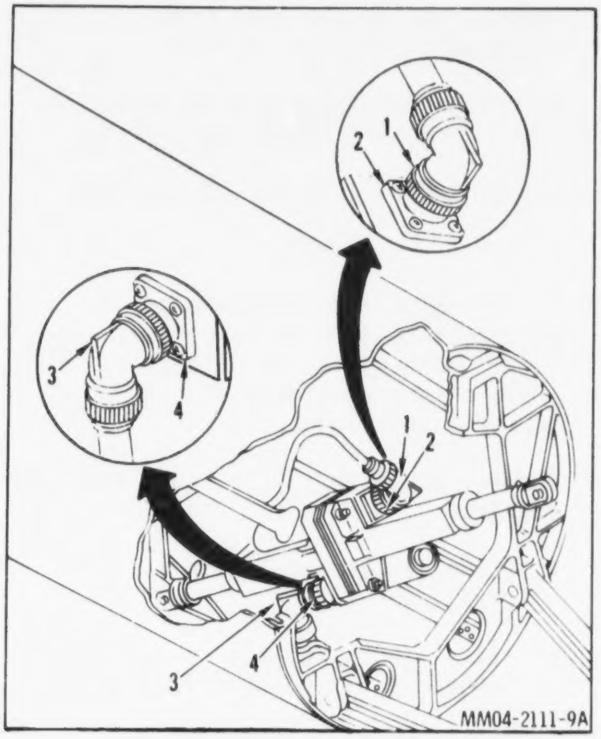
6. Attach connector P995 (1) to connector J995 (2).

7. Attach connector P996 (3) to connector J996 (4).

8. Inspect (TI).

9. Perform stabilator rigging operational check (para 11-6-19).

10. Secure access covers L545 and R545 (para 2-2-2).



END OF TASK

11-4-26. STABILATOR CONTROL UNIT REMOVAL 11-4-26

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

Equipment Conditions:

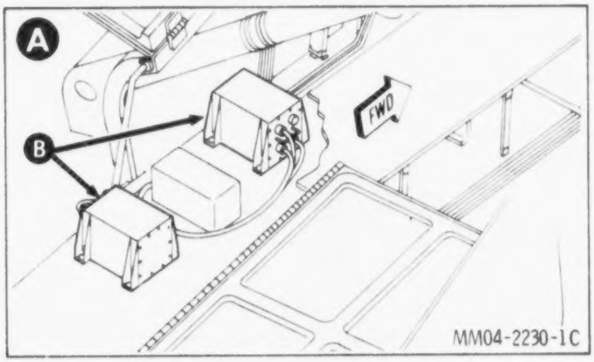
Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and L325 opened
2-3-10	Aft catwalk section removed

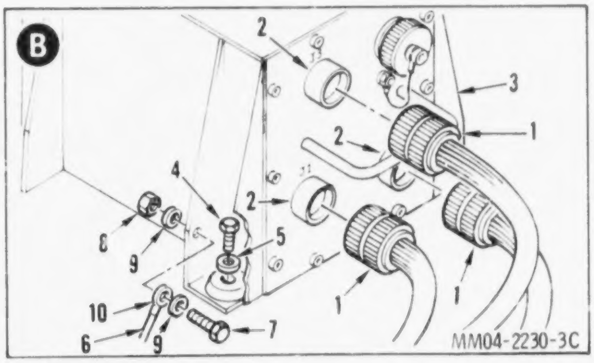
A. REMOVAL

NOTE

This task is typical for either stabilator controller. No. 1 is aft. No. 2 is forward.

1. **Detach three connectors (1) from three connectors (2).**
2. **Remove stabilator control unit (3).**
   a. Remove four bolts (4) and washers (5).
   b. Detach ground wire (6). Hold bolt (7). Remove nut (8), and washer (9). Remove bolt (7), and ground lug (10).
   c. Remove bolt (7), washer (9) and ground lug (10).
   d. Lift control unit (3) from helicopter.





END OF TASK

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check stabilator control unit and mounting surface for damage (para 11-4-1).
2. Check stabilator control unit and mounting surface for corrosion (para 1-5-38).

END OF TASK

11-4-27. STABILATOR CONTROL UNIT INSTALLATION 11-4-27

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

References:

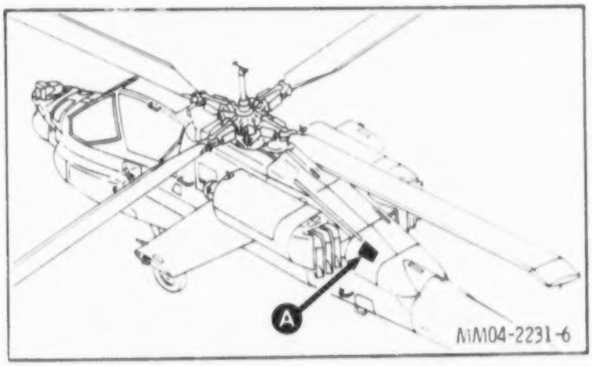
TM 55-1520-238-T

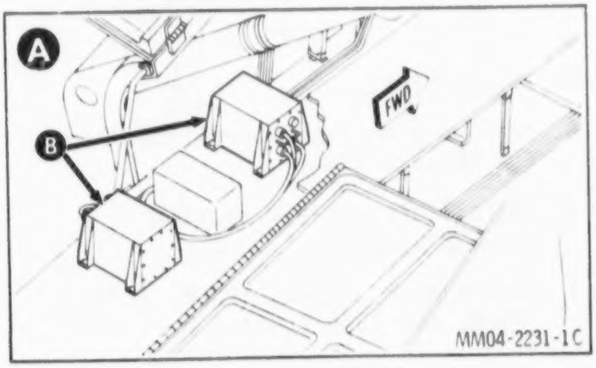
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

NOTE

This task is typical for either stabilator controller. No. 1 is aft. No. 2 is forward.





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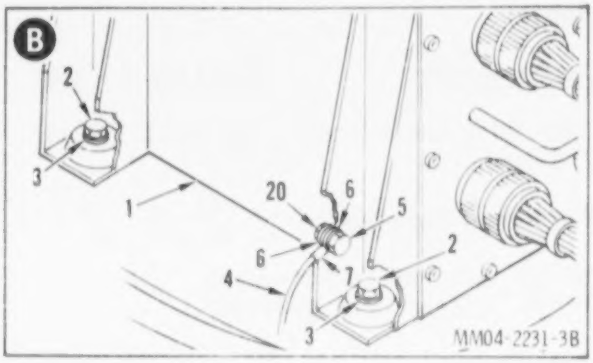
11-4-27. STABILATOR CONTROL UNIT INSTALLATION (cont)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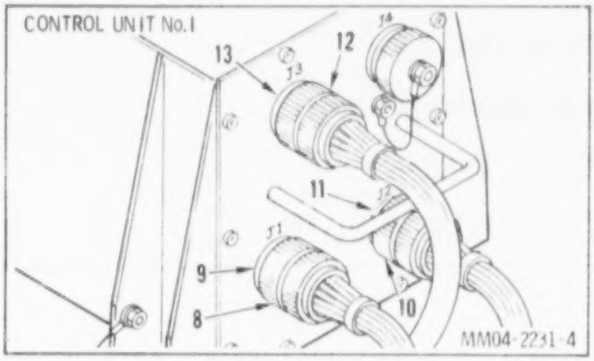
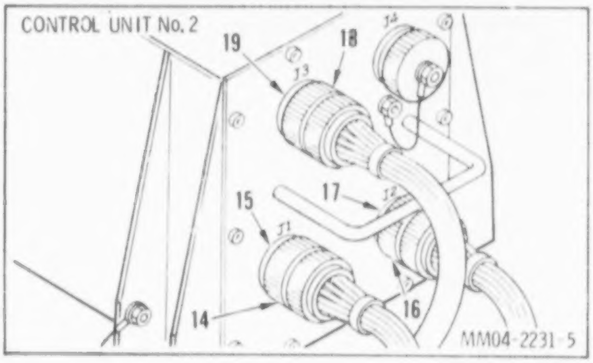

CONTROL UNIT No.1
14
13
12
J3
11
J2
J1
9
8
10
MM04-2231-4


CONTROL UNIT No.2
19
18
J3
17
J2
15
J1
14
16
MM04-2231-5

1. **Install stabilator control unit (1).** Install four washers (3) and four bolts (2).

2. **Attach ground wire (4).**

   a. Aline lug (7) with control unit (1).

   b. Install screw (5) through washer (6), lug (7), and control unit (1).

   c. Install washer (6) and nut (8) on screw (5).

3. **Attach connectors to stabilator control unit (1).**

   a. Stabilator control unit No. 1.

      (1) Attach connector P985 (9) to connector J1 (10).

      (2) Attach connector P986 (11) to connector J2 (12).

      (3) Attach connector P987 (13) to connector J3 (14).

   b. Stabilator control unit No. 2.

      (1) Attach connector P989 (15) to connector J1 (16).

      (2) Attach connector P990 (17) to connector J2 (18).

      (3) Attach connector P991 (19). to connector J3 (20).

4. **Inspect (TI).**

5. **Perform stabilator operational check** (TM 55-1520-238-T).

6. **Install aft catwalk section** (para 2-3-10).

7. **Secure doors T250L, T250R, T290L, T290R, and L325** (para 2-2-2).

END OF TASK

11-4-28. STABILATOR POSITION TRANSDUCER REMOVAL/INSTALLATION 11-4-28

This task includes: A. REMOVAL B. CLEANING C. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Tool Kit, Electrical Repairer's	5180-00-323-4915
Headset, Microphone	5965-00-755-4656
Cord Assy, Headset	4920-00-810-6256
Ground Power Unit, Aviation (AGPU)	1730-01-144-1897

Personnel Required:

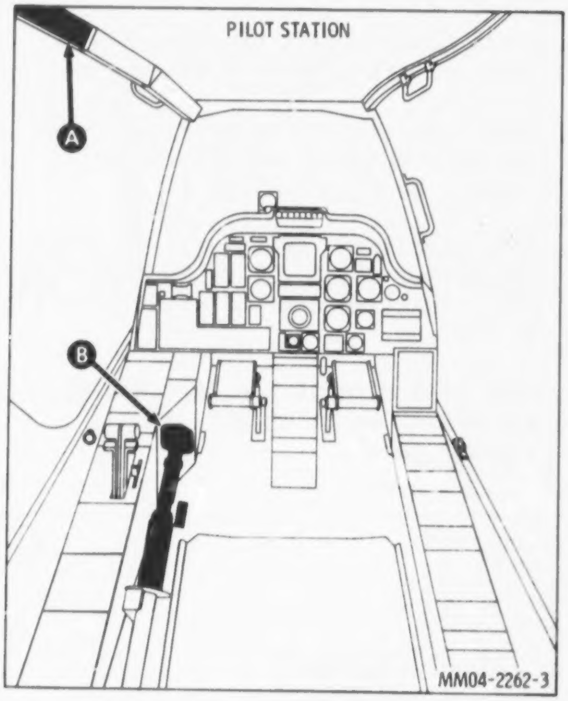
68F10	Aircraft Electrician
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access cover R545 removed



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11-4-28. STABILATOR POSITION TRANSDUCER REMOVAL/INSTALLATION (cont) 11-4-28

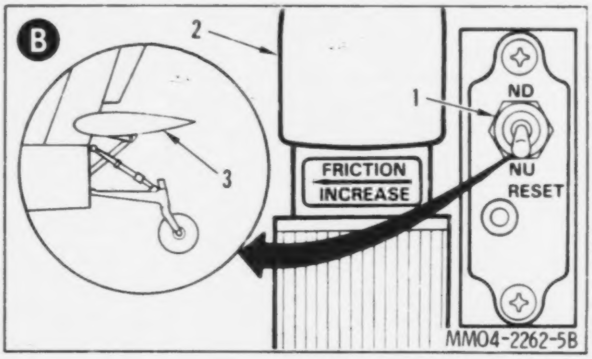
A. REMOVAL

1. Attach ground power unit (para 1-7-16). Observe all safety precautions.
2. Enter pilot station (para 1-7-1). Observe all safety precautions.
3. One person stationed at left wing tip for communications. Use microphone headset and cord.

WARNING

Movement of horizontal stabilator can cause personal injury. Do not actuate horizontal stabilator during maintenance. If injury occurs, seek medical aid.

4. Close STAB circuit breakers MAN DC on pilot aft circuit breaker panel.
5. Open STAB circuit breakers AUTO DC and AUTO AC on pilot aft circuit breaker panel.
6. Hold stabilator switch (1) on pilot collective stick (2) to NU (nose up) until trailing edge of stabilator (3) is full up.
7. Open STAB circuit breakers MAN DC and MAN AC on pilot aft circuit breaker panel.



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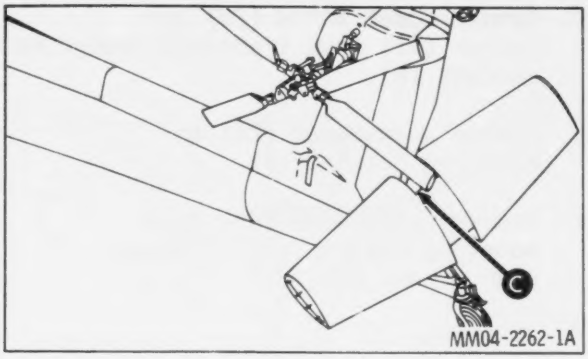
11-4-28. STABILATOR POSITION TRANSDUCER REMOVAL/INSTALLATION (cont) 11-4-28


C
MM04-2262-1A

8. Loosen bolt (4) on sensor clamp (5).

9. Remove lower screw (6) and washer (7) from transducer mounting bracket (8).

10. Remove clamp (9). Remove screw (10), washer (11), and spacer (12).

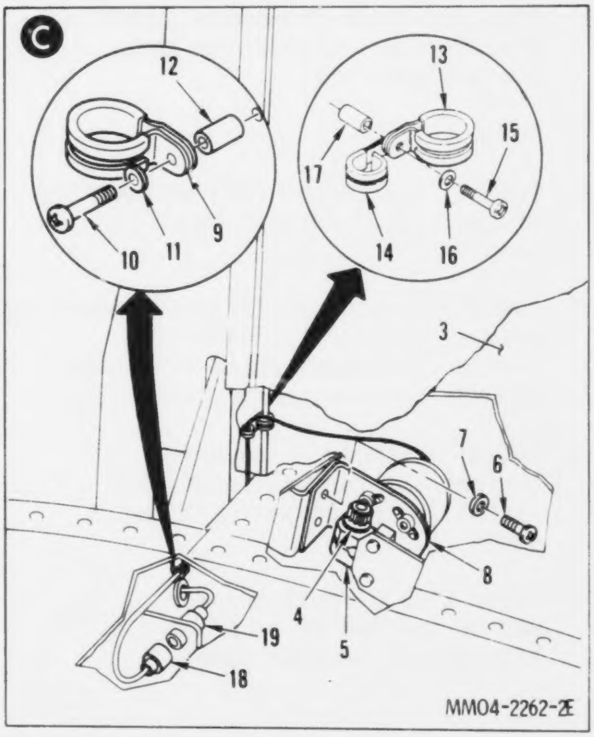
11. Remove two clamps (13) and (14). Remove screw (15), washer (16), and spacer (17).

12. Detach transducer connector P1076 (18) from connector J1076 (19).

13. Close STAB circuit breakers MAN DC and MAN AC on pilot aft circuit breaker panel.

14. Hold stabilator switch (1) on pilot collective stick (2), to ND (nose down) until trailing edge of stabilator (3) is full down.

15. Open STAB circuit breakers MAN DC and MAN AC on pilot aft circuit breaker panel.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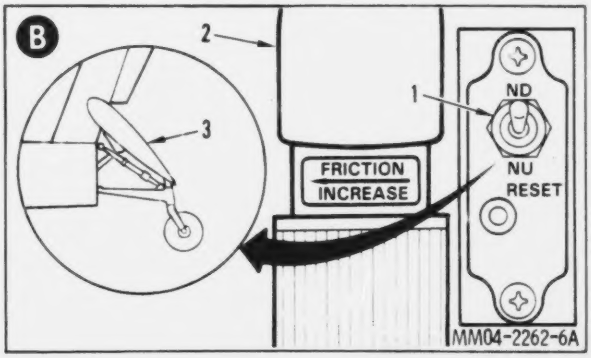
MM04-2262-2E


B
2
1
ND
3
FRICTION
INCREASE
NU
RESET
MM04-2262-6A

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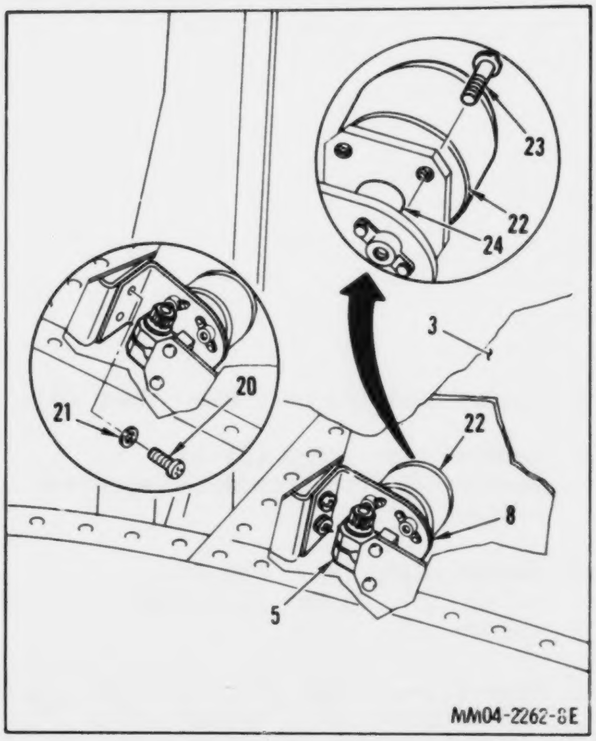
11-4-28. STABILATOR POSITION TRANSDUCER REMOVAL/INSTALLATION (cont) 11-4-28



16. **Remove upper screw (20) and washer (21) from transducer mounting bracket (8).**

17. **Remove transducer (22) and mounting bracket (8).**

18. **Remove transducer (22) from mounting bracket (8).** Remove four screws (23).

B. CLEANING

Wipe and check transducer mounting bracket and installation area. Use a clean cloth.

C. INSTALLATION

1. **Install transducer (22) on mounting bracket (8).** Install four screws (23).

2. **Install transducer (22) with mounting bracket (8) on stabilator (3).** Ensure transducer shaft (24) goes through hole in sensor clamp (5).

3. **Install transducer mounting bracket (8) to stabilator (3).** Install upper washer (21) and screw (20).

4. **Close STAB circuit breaker MAN DC and MAN AC on pilot aft circuit breaker panel.**

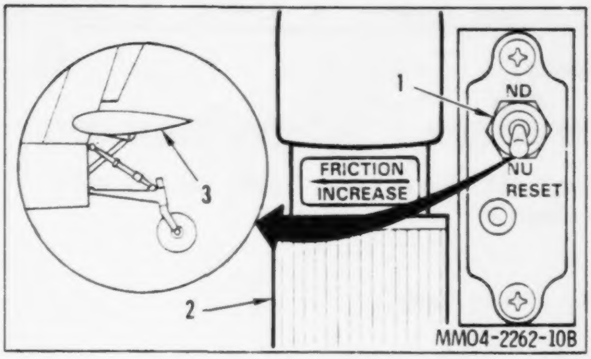
GO TO NEXT PAGE

11-4-28. STABILATOR POSITION TRANSDUCER REMOVAL/INSTALLATION (cont) 11-4-28

5. **On pilot collective stick (2), hold stabilator switch (1) to NU (nose up) position until trailing edge of stabilator (3) is full up.**

6. **Open STAB circuit breaker MAN DC and MAN AC on pilot aft circuit breaker panel.**

7. **Secure transducer mounting bracket (8) to stabilator.** Install lower screw (6) and washer (7).



8. **Install clamp (9).** Install screw (10) through washer (11), clamp (9), and spacer (12).

9. **Install two clamps (13) and (14).**

    a. Insert screw (15) through washer (16), clamps (13) and (14), and spacer (17).

    b. Tighten screw (15).

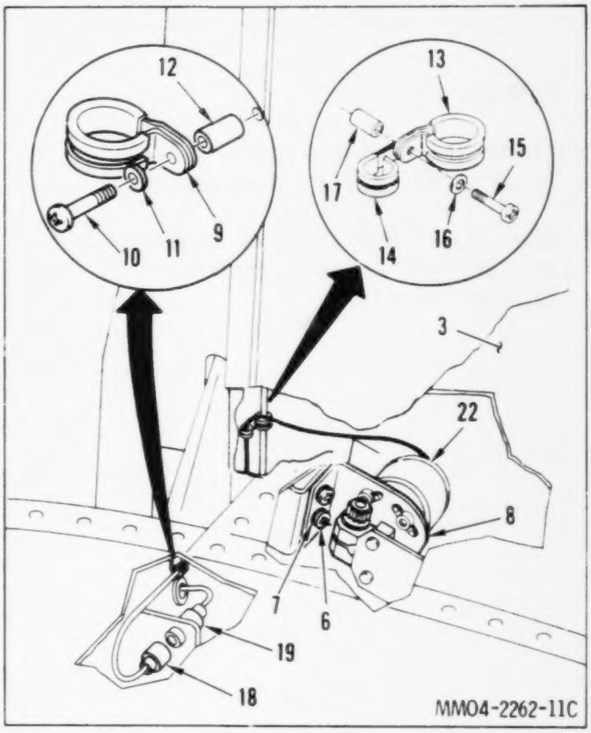
10. **Attach transducer connector P1076 (18) to connector J1076 (19).**

11. **Close STAB circuit breakers MAN DC and MAN AC on pilot aft circuit breaker panel.**

12. **Null position transducer (22).** Perform rigging horizontal stabilator (para 11-6-19).

13. **Inspect (TI).**

14. **Secure cover R545** (para 2-2-2).



15. **Open STAB circuit breakers MAN DC and MAN AC on pilot aft circuit breaker panel.**

16. **Perform stabilator operational check** (TM 55-1520-238-T).

17. **Detach ground power unit** (para 1-7-16).

END OF TASK

11-4-29. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER REMOVAL/INSTALLATION 11-4-29

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Materials/Parts:

(E32) Cloth, Lint-Free

Personnel Required:

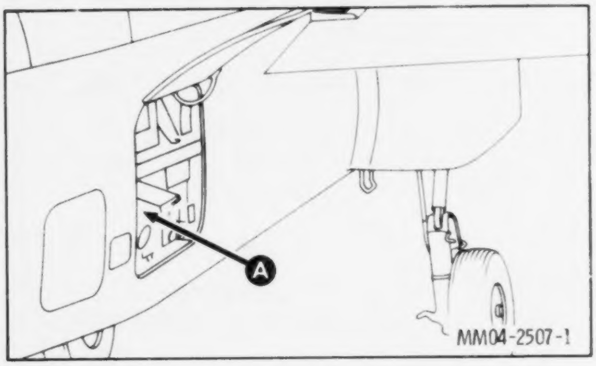
68F10	Aircraft Electrician
66R30	Inspector/Supervisor

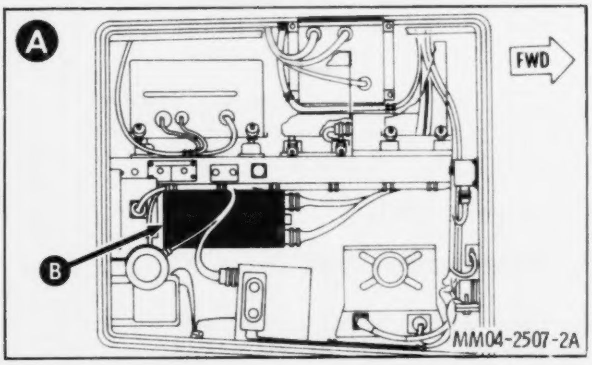
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access door R295 opened

A. REMOVAL

1. Enter CPG station (para 1-7-1). Observe all safety precautions.
2. Open seven MUX circuit breakers on CPG left console circuit breaker panel.





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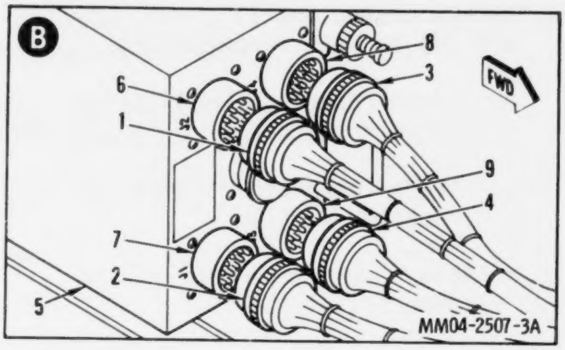
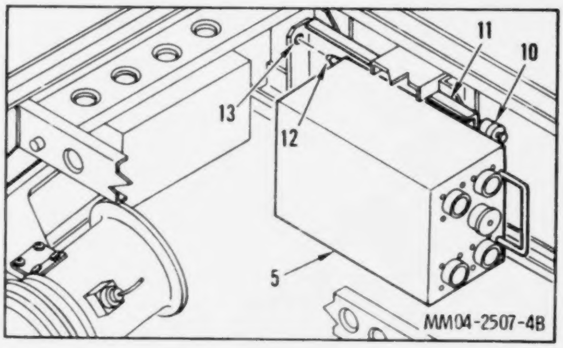
11-4-29. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER REMOVAL/INSTALLATION (cont) 11-4-29

3. **Detach connectors (1), (2), (3), and (4) from DASE computer (5).**
   a. Detach connector P686 (1) from connector J2 (6).
   b. Detach connector P688 (2) from connector J1 (7).
   c. Detach connector P683 (3) from connector J4 (8).
   d. Detach connector P682 (4) from connector J3 (9).
4. **Loosen two fasteners (10).**
5. **Remove DASE computer (5) from mounting tray (11).**



B. **CLEANING**

Wipe mounting tray with a clean cloth (E32).



C. **INSPECTION**

1. **Check mounting tray for cracks.**
2. **Check mounting tray for corrosion** (para 1-5-38).
3. **Check mounting tray for loose or missing hardware.**

D. **INSTALLATION**

1. **Install DASE computer (5).**
   a. Aline guide pins (12) with holes (13) in tray (11).
   b. Slide computer (5) in place.
2. **Tighten two fasteners (10).**

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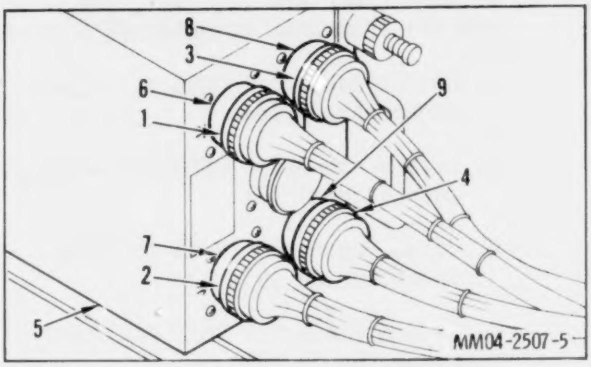
11-4-29. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER REMOVAL/INSTALLATION (cont) 11-4-29



3. **Attach connectors (1), (2), (3), and (4) to DASE computer (5).**
   a. Attach connector P686 (1) to connector J2 (6).
   b. Attach connector P688 (2) to connector J1 (7).
   c. Attach connector P683 (3) to connector J4 (8).
   d. Attach connector P682 (4) to connector J3 (9).
4. **Inspect (TI).**
5. **Secure access door R295** (para 2-2-2).
6. **Perform DASE operational check** (TM 55-1520-238-T).

END OF TASK

11-4-30. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER COVER REMOVAL/INSTALLATION 11-4-30

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

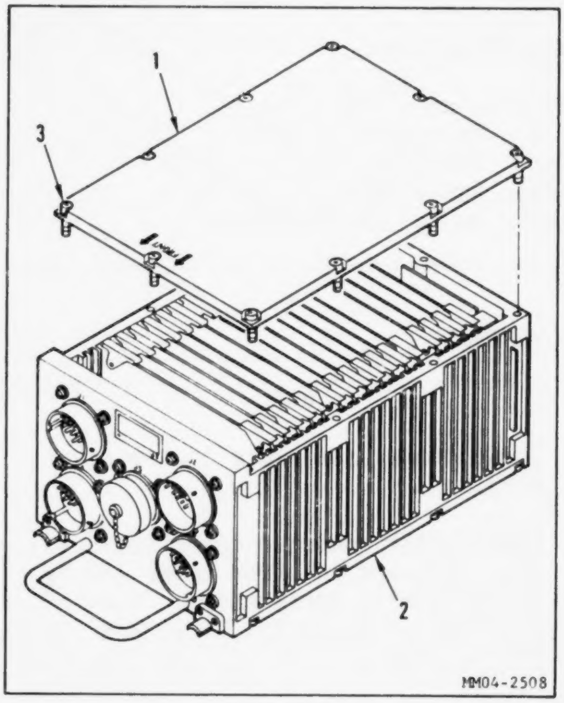
68F10	Aircraft Electrician
66R30	Inspector/Supervisor

Materials/Parts:

(E32) Cloth, Lint-Free

A. REMOVAL

Remove DASE computer top cover (1) and bottom cover (2) by loosening 10 captive screws (3).



B. CLEANING

Wipe DASE computer covers with a clean cloth (E32).

C. INSPECTION

1. **Check DASE computer covers for cracks.**
2. **Check covers for damaged or missing seals.** Repair (para 11-4-31).
3. **Check covers for damaged or missing captive screws** (TM 55-1500-204-25/1).
4. **Check covers for damage.** Damage not to exceed 25% of cover and no more than 20% of material thickness after repair.

D. INSTALLATION

1. **Install DASE computer top cover (1) and bottom cover (2). Tighten 10 screws (3).**
2. **Inspect (TI).**

END OF TASK

11-4-31. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER COVER SEAL REPLACEMENT 11-4-31

This task covers: A. REMOVAL B. CLEANING C. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Knife, Putty	5120-00-221-1536
Goggles	4240-00-052-3776
Respirator, Air Filtering	4240-00-022-2524
Gloves	6515-00-782-6472

Materials/Parts:

(E32)	Cloth, Lint-Free
(E1)	Solvent
(E84)	Adhesive
(E85)	Adhesive
(E22)	Methyl Ethyl Ketone

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

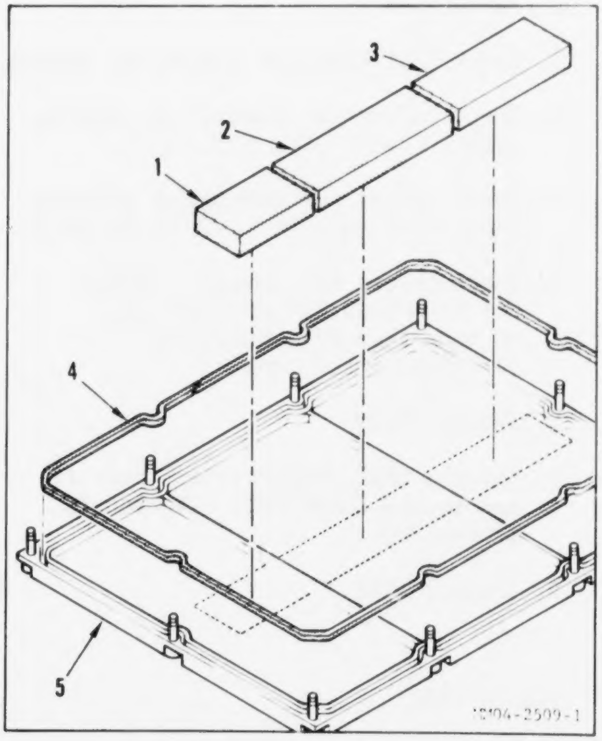
Ref	Condition
11-4-30	DASE computer covers removed

A. **REMOVAL**

NOTE

Three center seals are on top cover only.

1. **Remove DASE computer cover seals (1), (2), (3), and (4) from cover (5) by scraping with putty knife.** Note position of seals (1), (2), and (3) before removal.



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11-4-31. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER COVER SEAL REPLACEMENT (cont) 11-4-31

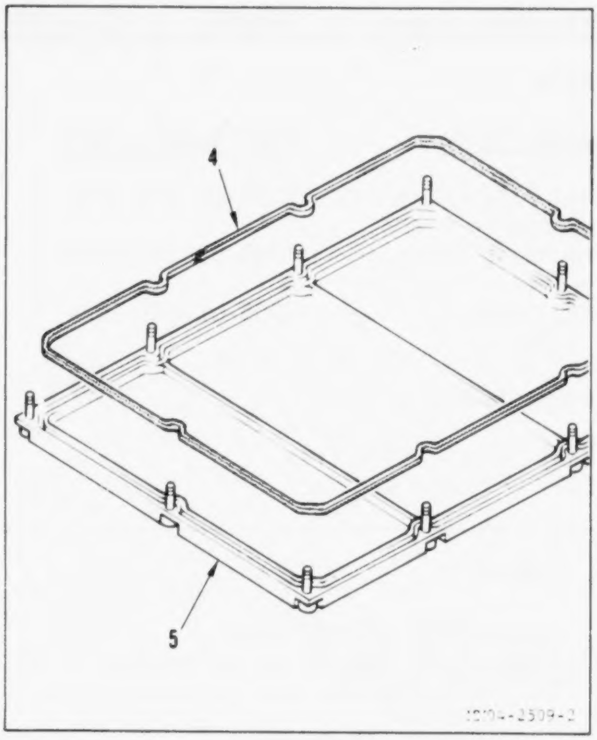
B. CLEANING

WARNING

Solvents are flammable and toxic. Use in well ventilated area away from open flames. If solvents come in contact with eyes or skin, flush with water. If injury occurs, seek medical aid.

1. Remove residual adhesive with MEK (E22) and a cloth (E32).

2. Wipe cover (5) with a clean cloth (E32) and solvent (E1).

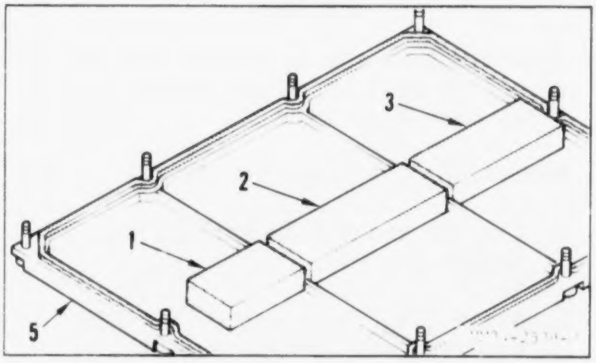


C. INSTALLATION

NOTE

Mix and cure adhesive according to container instructions.

1. Install DASE computer cover seal (4) on cover (5).
   a. Apply adhesive (E84) sparingly to back surface of seal (4).
   b. Mount seal (4) on cover (5). Splice at slight angle on any straight side of cover (5).
   c. Allow adhesive (E84) to cure.



2. Install DASE computer seals (1), (2), and (3) on cover (5).
   a. Apply adhesive (E85) sparingly to back surface of seals (1), (2), and (3).
   b. Mount seals (1), (2), and (3) in original position on cover (5).
   c. Allow adhesive (E85) to cure.

3. Inspect (TI).

4. Install computer covers (para 11-4-30).

END OF TASK

11-4-32. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER CIRCUIT CARD REMOVAL/INSTALLATION 11-4-32

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Grounding Strap, Large	4240-01-165-8865
Bar, Shunt 4-inch	1005-01-241-4925

Materials/Parts:

(E32)	Cloth, Lint-Free
(E83)	Plastic Bag

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
11-4-30	DASE computer top cover removed

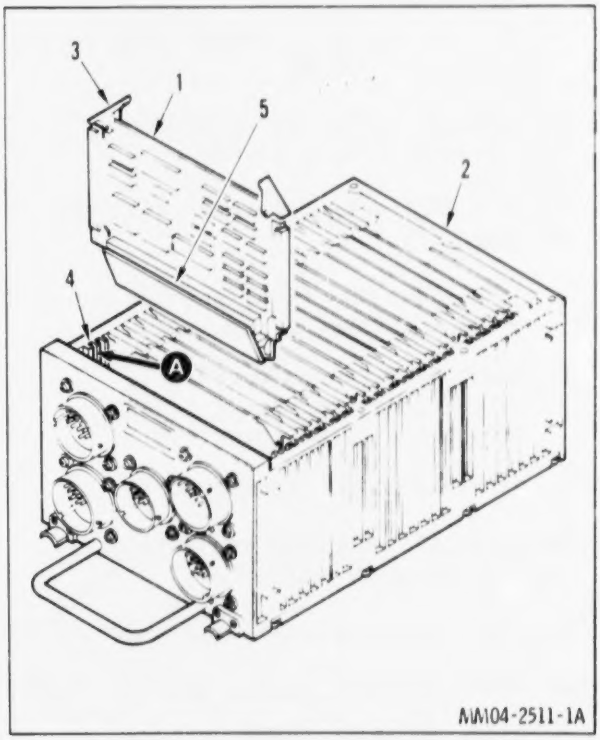
A. **REMOVAL**

1. **Locate DASE circuit card (CCA) to be removed by reference listing in cover.**

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling CCA.

2. **Remove CCA (1) from chassis (2).**
   a. Lift up and out on both card extractors (3).
   b. Grasp CCA (1) at top. Lift CCA from chassis card guides (4).
3. **Attach shunt bar (5)**
4. **Store CCA in plastic bag (E83).**



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11-4-32. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER CIRCUIT CARD REMOVAL/INSTALLATION (cont) 11-4-32

B. CLEANING

Wipe chassis card guides with a clean cloth (E32).

C. INSPECTION

Check motherboard connector for debris.

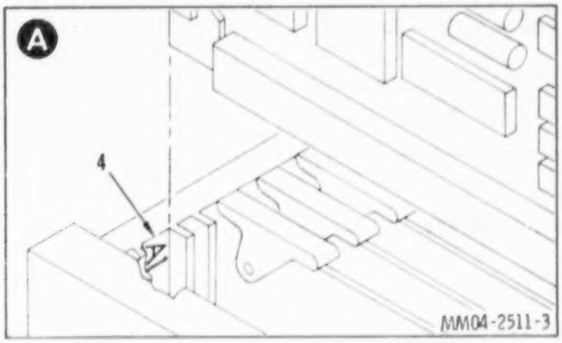
D. INSTALLATION

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling CCA.

1. Attach ground strap.
2. Remove CCA from plastic bag (E83).
3. Remove shunt bar.
4. Install CCA (1) in chassis (2) from reference listing in cover.
   a. Slide CCA (1) into chassis card guides (4).
   b. Seat CCA (1) by pressing down on card extractors (3).
5. Inspect (TI).
6. Install top cover (para 11-4-30).

END OF TASK



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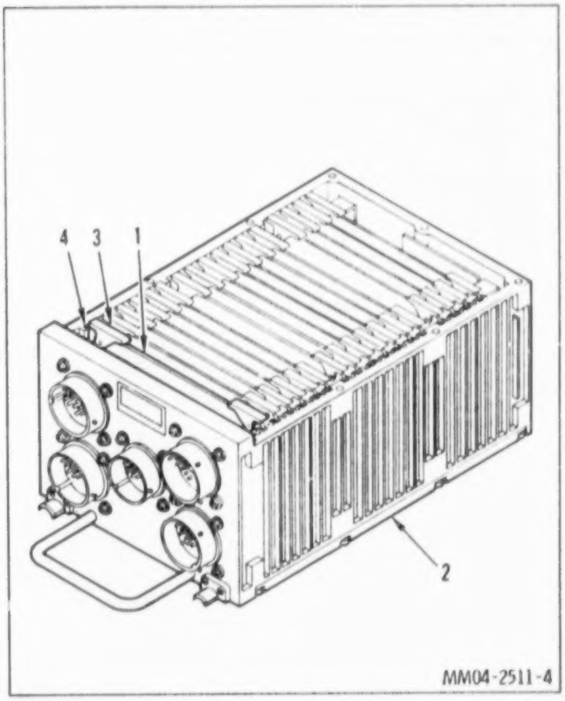

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11-4-33. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER POWER SUPPLY REMOVAL/INSTALLATION 11-4-33

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Grounding Strap, Large	4240-01-165-8865
Bar, Shunt	1005-01-241-4925

Materials/Parts:

(E32)	Cloth, Lint-Free
(E94)	Plastic Bag

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

Equipment Conditions:

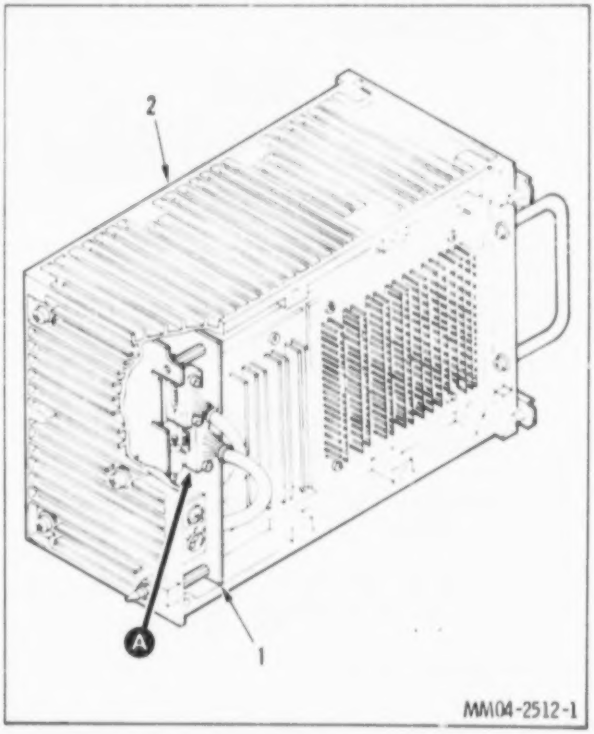
Ref	Condition
11-4-30	DASE computer covers removed

A. REMOVAL

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling power supply.

1. **Remove power supply (1) from computer (2).**



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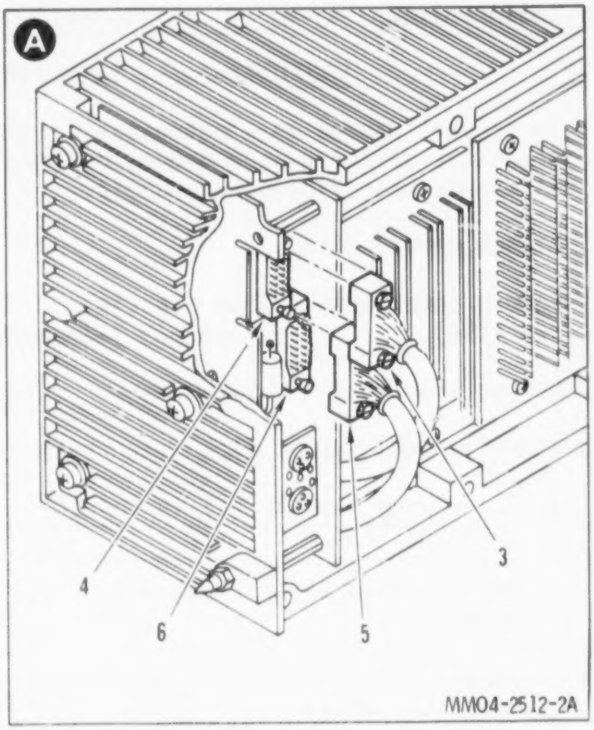
11-4-33. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER POWER SUPPLY REMOVAL/INSTALLATION (cont) 11-4-33

a. Detach connector P6 (3) from connector J6 (4).

b. Detach connector P7 (5) from connector J7 (6).



MM04-2512-2A

c. Remove five screws (7) and washers (8).

d. Slide power supply (1) from top of computer (2).

2. Attach shunt bar (9).

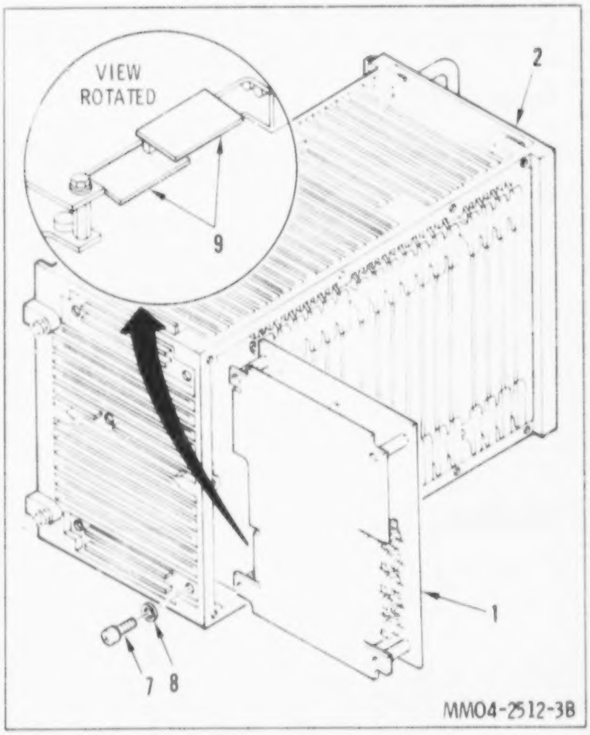
3. Store power supply in plastic bag (E94).

B. CLEANING

Wipe power supply with a clean cloth (E32).

C. INSPECTION

Check power supply and computer for damage.



MM04-2512-3B

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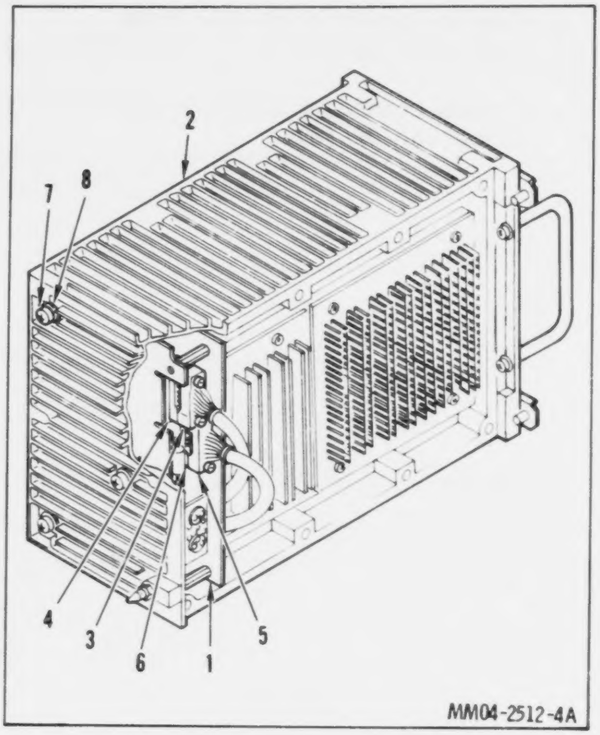
11-4-33. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER POWER SUPPLY REMOVAL/INSTALLATION (cont) 11-4-33

D. INSTALLATION

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling power supply.

1. **Attach ground strap.**
2. **Remove power supply from plastic bag (E94).**
3. **Remove shunt bar.**
4. **Install power supply (1).**
   a. Slide power supply (1) in top of computer (2).
   b. Install five washers (8) and screws (7).
   c. Attach connector P6 (3) to connector J6 (4).
   d. Attach connector P7 (5) to connector J7 (6).
5. **Inspect (TI).**
6. **Install covers** (para 11-4-30).



END OF TASK

11-4-34. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER POWER SUPPLY CIRCUIT CARD REPLACEMENT 11-4-34

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Grounding Strap, Large	4240-01-165-8865
Bar, Shunt	1005-01-241-4925

Materials/Parts:

(E32)	Cloth, Lint-Free
(E94)	Plastic Bag

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
11-4-33	DASE power supply assembly removed

A. REMOVAL

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling CCA.

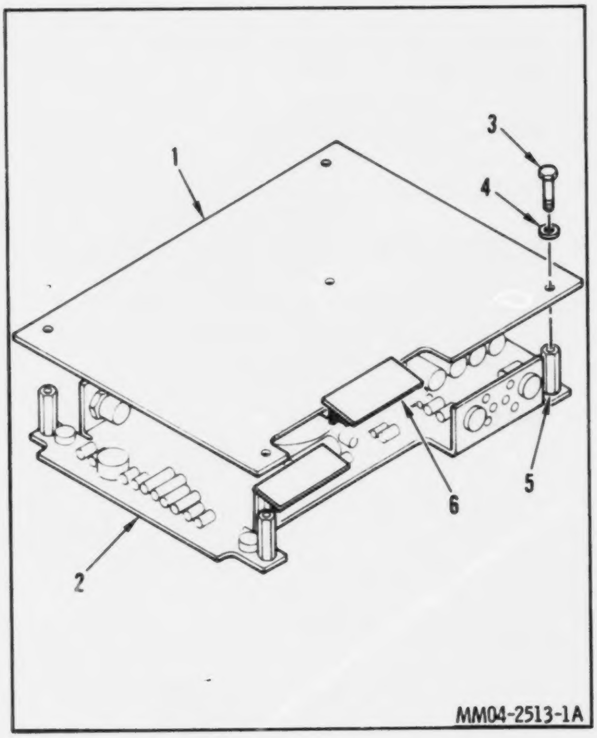
1. **Remove power supply circuit card assembly (CCA) (1) from power supply chassis (2).** Remove five screws (3) and five washers (4) from five posts (5).

2. **Attach shunt bar (6).**

3. **Store CCA in plastic bag (E94).**

B. CLEANING

Wipe power supply chassis with a clean lint free cloth (E32).



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11-4-34. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) COMPUTER POWER SUPPLY CIRCUIT CARD REPLACEMENT (cont)

C. INSPECTION

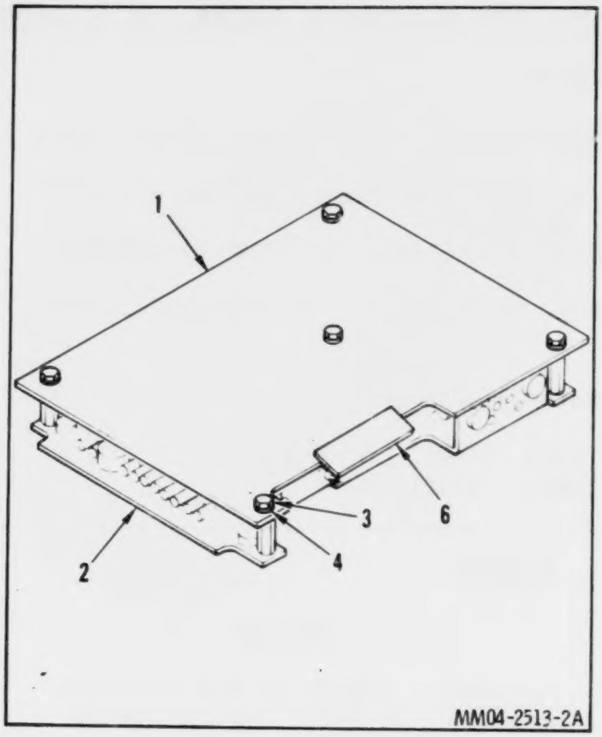
1. Check circuit card and attaching parts for damage (para 11-4-1).
2. Check circuit card and attaching parts for corrosion (para 1-5-38).

D. INSTALLATION

CAUTION

To prevent damage to electrostatic sensitive devices, wear grounding strap when handling CCA.

1. Attach ground strap.
2. Remove CCA (1) from plastic bag (E94).
3. Remove shunt bar (6).
4. Install CCA (1) on chassis (2).
   a. Mount CCA (1) on chassis (2).
   b. Install five washers (4) with five screws (3) through CCA(1) into five posts (5).
5. Inspect (TI).



END OF TASK

11-4-35. DIGITAL AUTOMATIC STABILIZATION EQUIPMENT (DASE) ELECTRICAL EQUIPMENT CHASSIS REPLACEMENT 11-4-35

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Set, Electrical Repairer's	5180-00-323-4915

Equipment Conditions:

Ref	Condition
11-4-30	Covers removed
11-4-32	Circuit cards removed
11-4-33	Power supply removed

Personnel Required:

68F10	Aircraft Electrician
66R30	Inspector/Supervisor

A. **REMOVAL**

NOTE

Chassis has been removed after all preliminary tasks have been performed.

B. **CLEANING**

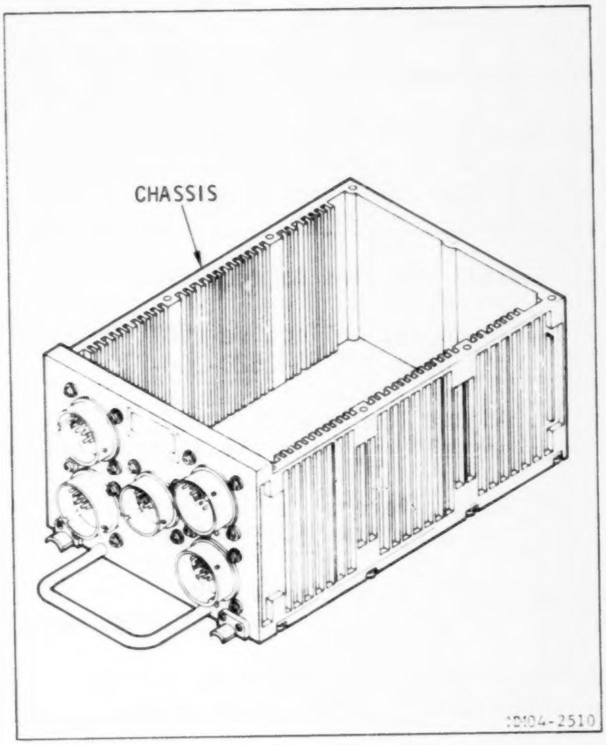
Wipe chassis with a clean rag.

C. **INSPECTION**

1. **Check chassis for damage** (para 11-4-1).
2. **Check chassis for corrosion** (para 1-5-38).

D. **INSTALLATION**

1. **Install power supply** (para 11-4-33).
2. **Install circuit cards** (para 11-4-32).
3. **Inspect (TI).**
4. **Install covers** (para 11-4-30).



END OF TASK

11-4-36. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT 11-4-36

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Rigging Kit, Control System	1730-01-240-1577
Wrench, Torque 1/4 Drive	5120-00-585-8434
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Materials/Parts:

(E34) Lockwire

Personnel Required:

68F10	Aircraft Electrician (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
1-7-16	External electrical power applied
1-7-18	External hydraulic power applied
TM 55-1520-238-T	Flight controls rigging operational check for desired system performed

---

1. **Install rig pins as required.**

   a. To adjust collective LVDT, install rig pins (TM 55-1520-238-T).

   b. Adjust longitudinal LVDT, install rig pins (TM 55-1520-238-T).

   c. Adjust lateral LVDT, install rig pins (TM 55-1520-238-T).

   d. Adjust directional LVDT, install rig pins (TM 55-1520-238-T).

2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

3. **Open ASE DC circuit breaker on pilot center circuit breaker panel,**

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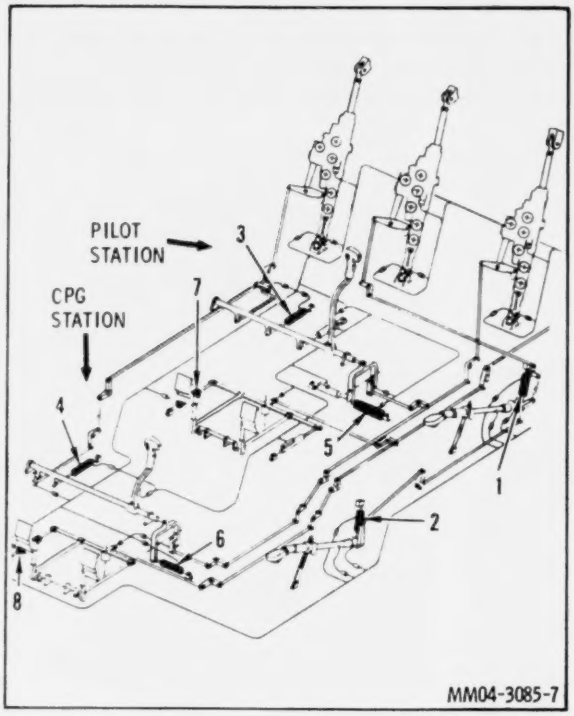
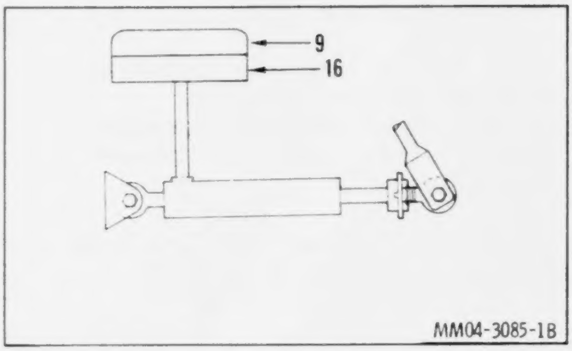
11-4-36. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT (cont) 11-4-36



WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current VDC 28 and/or 115 VAC are present. Failure to do so could result in death or serious injury. If injury occurs, seek medical aid.

4. **Check for 26 VAC at the corresponding LVDT.**
   a. To check for 26 VAC at pilot collective LVDT (1) or CPG collective LVDT (2): detach connector P230 (9) from connector J230 (16) or connector P234 (9) from connector J234 (16). Check for 26 VAC at the corresponding LVDT connector pins (para 11-4-37), table 5).
   b. To check for 26 VAC at pilot longitudinal LVDT (3) or CPG longitudinal LVDT (4): detach connector P232 (9) from connector J232 (16) or connector P236 (9) from connector J236 (16). Check for 26 VAC at the corresponding LVDT connector pins (para 11-4-37), table 5).
   c. To check for 26 VAC at pilot lateral LVDT (5) or CPG lateral LVDT (6): detach connector P233 (9) from connector J233 (16) or connector P237 (9) from connector J237 (16). Check for 26 VAC at the corresponding LVDT connector pins (para 11-4-37, table 5).
   d. To check for 26 VAC at pilot directional LVDT (7) or CPG directional LVDT (8): detach connector P231 (9) from connector J231 (16) or connector P235 (9) from connector J235 (16). Check for 26 VAC at corresponding LVDT connector pins (para 11-4-37, table 5).



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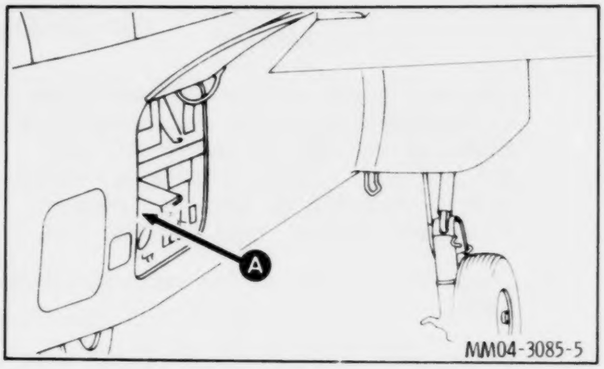
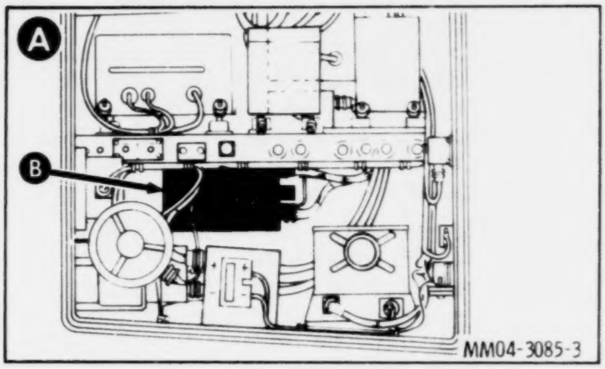
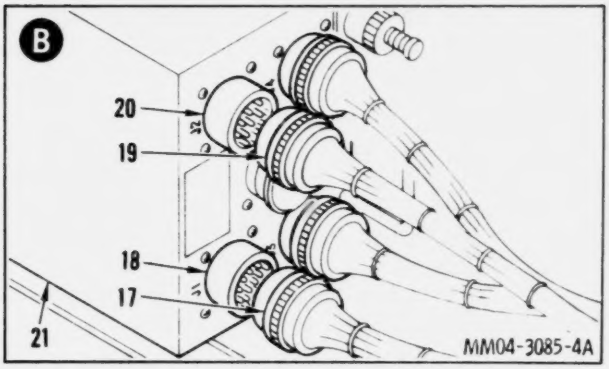
11-4-36. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT (cont) 11-4-36

5. If 26 VAC in step 4 a. thru d. is not present, perform DASE FD/LS operational check (TM 55-1520-238-T).





6. Detach connector P688 (17) from connector J1 (18) and connector P686 (19) from connector J2 (20) on DASE computer (21).
7. Check for null of less than 0.05 volt RMS at corresponding servocylinder RAM LVDT connector pins (11-4-37, table 1). Record indication.
8. If voltage in step 7 is less than 0.05 volt RMS, go to step 11.



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11-4-36. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT (cont) 11-4-36

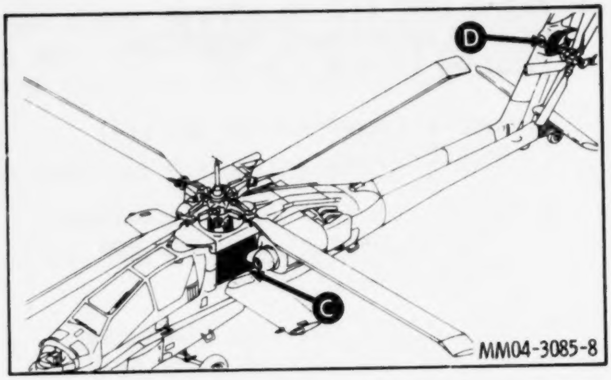
9. **Manually move push-pull rod (22) or (23) of the corresponding servocylinder to obtain null of less than 0.05 volt RMS.** Record new indication.

10. **If null of less than 0.05 volt RMS can not be obtained, adjust push-pull rod (22) or (23) rod end to lowest DVM indication (null) less than 0.05 volt RMS** (para 11-2-2).

11. **Check for less than 0.150 volt RMS at corresponding servocylinder SCAS LVDT connector pins** (para 11-4-37, table 4).

12. **If voltage is not present, replace servocylinder.**
    - a. To replace collective servocylinder, go to para 7-2-42.
    - b. To replace longitudinal servocylinder, go to para 7-2-48.
    - c. To replace lateral servocylinder, go to para 7-2-45.
    - d. To replace directional servocylinder, go to para 7-2-39.

13. **Check for null of less than 0.100 volt RMS at the corresponding LVDT connector pins** (para 11-4-37, table 2-PLT or table 3-CPG). If LVDT requires adjustment, go to step 14. If no adjustment is necessary, go to step 17.



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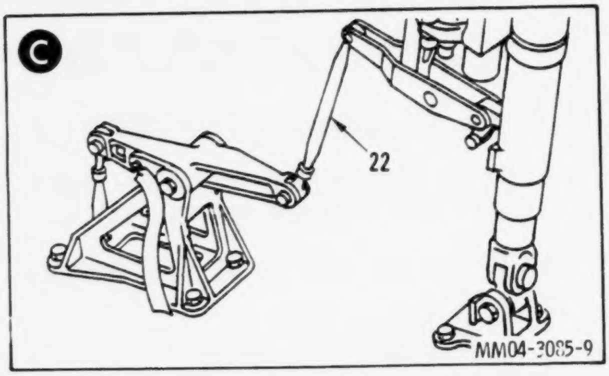
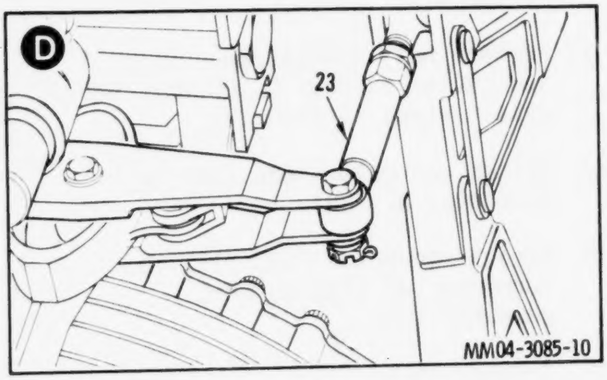


MM04-3085-9



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11-4-36. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT (cont) 11-4-36

14. **Adjust LVDT (11) to achieve null of approximate indication recorded in step 7 or 9.**

    a. Remove lockwire from nut (14) on LVDT (11).

    b. Loosen nut (14) until lockwasher (13) is clear of LVDT rod end recess (12).

    c. Rotate LVDT rod (10) clockwise or counterclockwise until null approximates indication recorded in step 7 or 9. Null is not to exceed 0.100 volt RMS.

15. **Torque nut (14) to 35 INCH-POUNDS.**

    a. Aline tab (15) of lockwasher (13) with LVDT rod end recess (12).

    b. Torque nut (14) to **35 INCH-POUNDS.**

    c. Lockwire nut (14) to lockwasher (13). Use lockwire (E34).

16. **Recheck null indication.** If null indication exceeds 0.100 volt RMS, repeat steps 13 thru 15.

17. **Attach connector P686 (19) to connector J2 (20).**

18. **Attach connector P688 (17) to connector J1 (18) on DASE computer (21).**

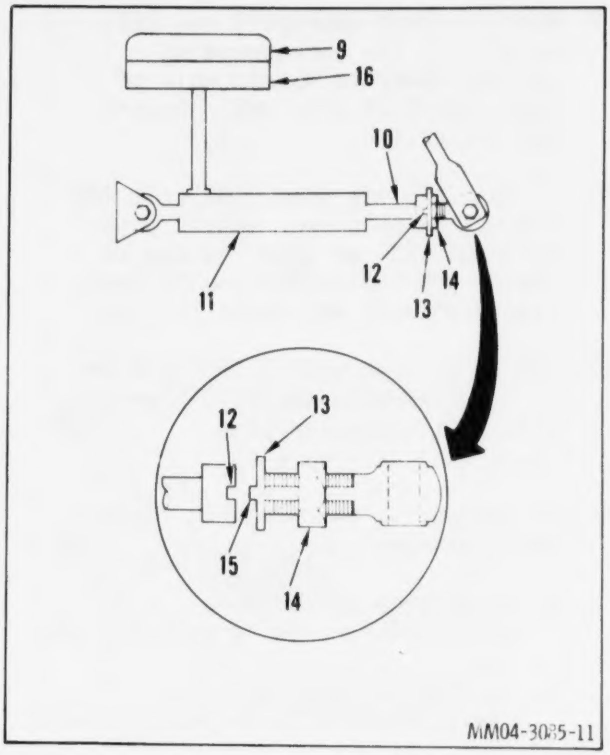
19. **Inspect (TI).**

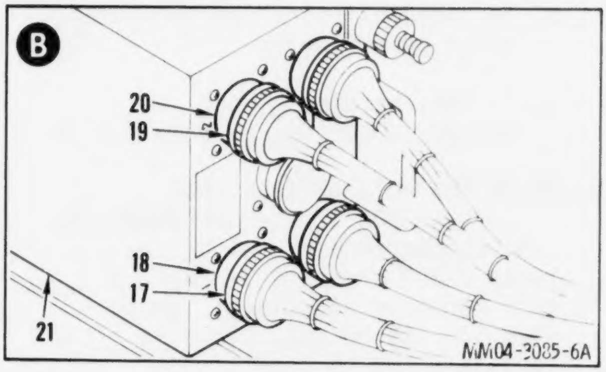
20. **Remove rig pins as required** (TM 55-1520-238-T).

21. **Inspect (TI).**

22. **Perform digital automatic stabilization (DASE) FD/LS operational check** (TM 55-1520-238-T).

END OF TASK





11-4-37. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT CRITERIA 11-4-37

1. **The linear variable differential transducer (LVDT) adjustment criteria provide connector views and pin locations for the null adjustment of the LVDT for each axis of the flight controls.** The connector views and pin locations are presented in tabular form.

Table 1.	Provides connector view and pins required for null adjustment of the servocylinder RAM LVDTs.
Table 2.	Provides connector view and pins required for null adjustment of the pilot stick/pedal LVDTs.
Table 3.	Provides connector view and pins required for null adjustment of the CPG stick/pedal LVDTs.
Table 4.	Provides connector view and pins required for voltage check of the servocylinder SCAS LVDTs.
Table 5.	Provides connector view and pins required for voltage check of the pilot and CPG stick/pedal LVDTs.

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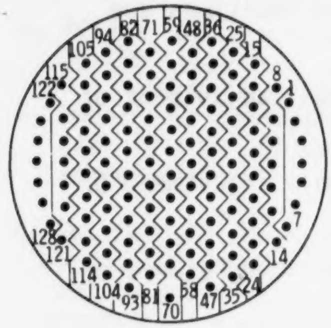
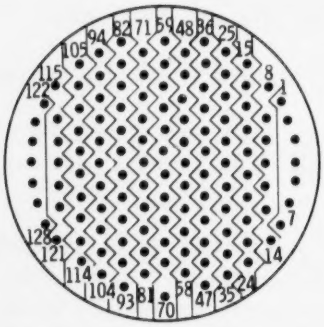
11-4-37. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT CRITERIA (cont) 11-4-37

TABLE 1

CONNECTOR VIEW	AXIS	COMPONENT	PLUG	PINS
	PITCH	LONG SERVOCYLINDER LVDT (RAM)	P688 P686	36, 37, 42, 43
	ROLL	LAT SERVOCYLINDER LVDT (RAM)	P688 P686	39, 40, 44, 45
	YAW	DIR SERVOCYLINDER LVDT (RAM)	P688 P686	42, 43, 46, 47
	COLLECTIVE	COLL SERVOCYLINDER LVDT (RAM)	P688 P686	45, 46, 57, 58

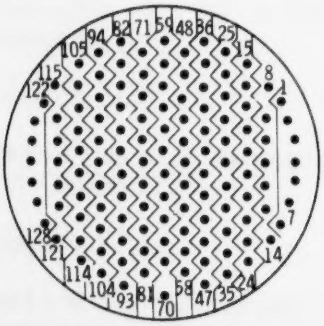
94
82
71
59
48
36
25
105
15
8
1
115
122
7
128
121
14
114
104
93
81
70
58
47
35
24

TABLE 2

CONNECTOR VIEW	AXIS	COMPONENT	PLUG	PINS
	PITCH	STICK LVDT	P688	8, 15
	ROLL	STICK LVDT	P688	9, 10
	YAW	PEDAL LVDT	P688	17, 18
	COLLECTIVE	STICK LVDT	P688	20, 21

94
82
71
59
48
36
25
105
15
8
1
115
122
7
128
121
14
114
104
93
81
70
58
47
35
24

TABLE 3

CONNECTOR VIEW	AXIS	COMPONENT	PLUG	PINS
	PITCH	STICK LVDT	P686	26, 27
	ROLL	STICK LVDT	P686	36, 37
	YAW	PEDAL LVDT	P686	40, 41
	COLLECTIVE	STICK LVDT	P686	38, 39

94
82
71
59
48
36
25
105
15
8
1
115
122
7
128
121
14
114
104
93
81
70
58
47
35
24

MM04-3493-1 FP

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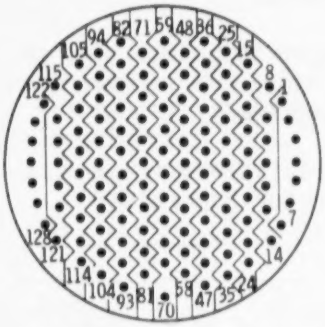
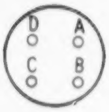
11-4-37. LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT) ADJUSTMENT CRITERIA (cont) 11-4-37

TABLE 4

CONNECTOR VIEW	AXIS	COMPONENT	PLUG	PINS
	PITCH	LONG SERVOCYLINDER SCAS LVDT	P688	23, 24
	ROLL	LAT SERVOCYLINDER SCAS LVDT	P688	25, 26
	YAW	DIR SERVOCYLINDER SCAS LVDT	P688	27, 28
	COLLECTIVE	COLL SERVOCYLINDER SCAS LVDT	P688	29, 30

94
82
71
59
48
36
25
15
8
1
105
115
122
7
128
121
114
104
93
81
70
58
47
35
24
14

TABLE 5

CONNECTOR VIEW	AXIS	COMPONENT	PLUG	PINS
	PITCH	PLT LONG LVDT CPG LONG LVDT	P232 P236	A, B A, B
	ROLL	PLT LAT LVDT CPG LAT LVDT	P233 P237	A, B A, B
	YAW	PLT DIR LVDT CPG DIR LVDT	P231 P235	A, B A, B
	COLLECTIVE	PLT COLL LVDT CPG COLL LVDT	P230 P234	A, B A, B

END OF TASK

MM04-3493-2 FP

11-4-38. ASE PANEL CIRCUIT CARD REPLACEMENT (AVIM) 11-4-38

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Iron, Soldering	3439-00-853-8760

Materials/Parts:

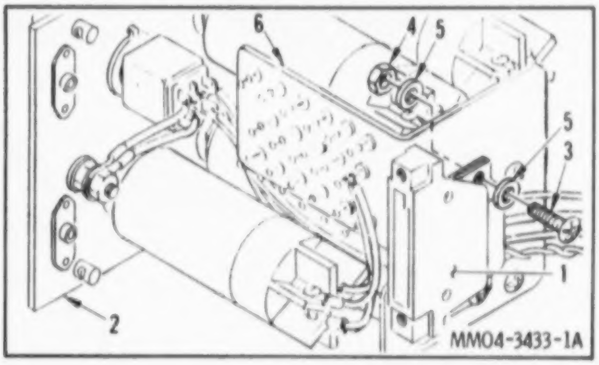
(E50) Solder

Personnel Required:

68F10 Aircraft Electrician
66R30 Inspector/Supervisor

A. REMOVAL

1. **Remove connector J1 (1) from ASE panel (2) circuit card (6).**
   a. Hold two screws (3). Remove two nuts (4) and washers (5).
   b. Remove two screws (3) and washers (5).
   c. Remove connector J1 (1) from circuit card (6).



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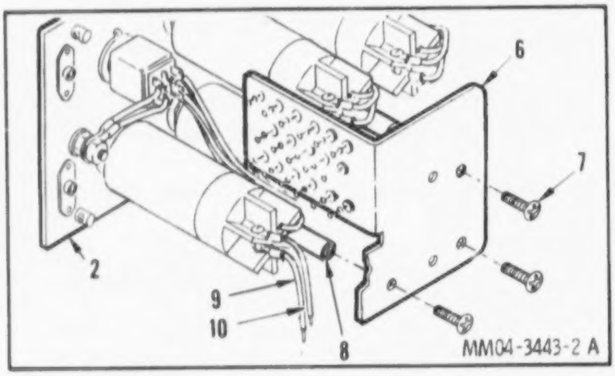
WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

2. Remove circuit card (6) from ASE panel (2).
   a. Remove three screws (7) from three posts (8).
   b. Identify and desolder wires (9) from circuit card terminals (10). Use soldering iron.
   c. Remove circuit card (6) from ASE panel (2).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

Check ASE panel, components, and wires for cracks, dents, nicks, corrosion, and damage.

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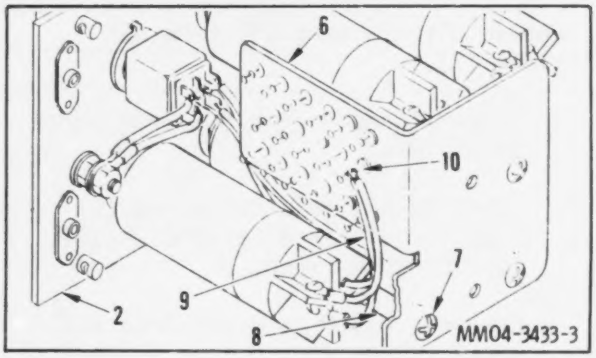
11-4-38. ASE PANEL CIRCUIT CARD REPLACEMENT (AVIM) (cont) 11-4-38

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

1. **Install circuit card (6) on ASE panel (2).**
   a. Solder wires (9) to terminals (10). Use soldering iron and solder (E50).
   b. Remove identification from wires (9).
   c. Aline circuit card (6) with three posts (8).
   d. Install three screws (7) through circuit card (6) in posts (8).



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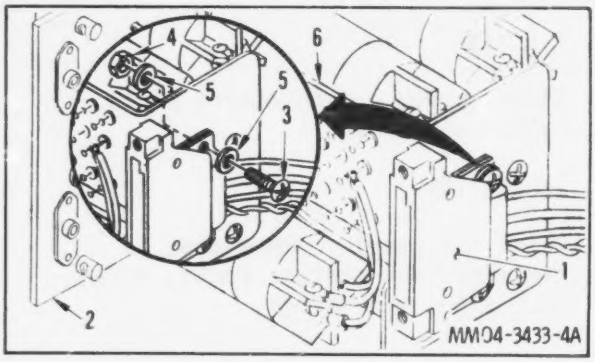
2. **Install connector J1 (1) on ASE panel (2) circuit card (6).**
   a. Aline holes of connector J1 (1) with holes on circuit card (6).
   b. Install two screws (3) through washers (5), connector (1), and circuit card (6).



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3. **Inspect (TI).**

END OF TASK

11-4-39. STABILATOR ACTUATOR DISASSEMBLY/ASSEMBLY 11-4-39

This task covers: A. DISASSEMBLY B. CLEANING C. INSPECTION D. ASSEMBLY

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Crowfoot Attachment 1-1/8 inch, 3/8 Drive	5120-00-517-7021
Wrench, Torque 3/8 Drive	5120-00-288-8865
Wrench, Open-end, 1 and 1-1/8 inch	5120-00-187-7133
Knife, Putty	5120-00-221-1536

Materials/Parts:

	Cotter Pins (4)
(E29)	Lockwire
(E127)	Compound, Sealing

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

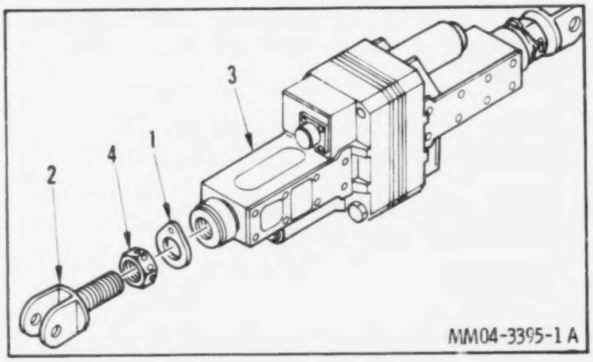
TM 55-1500-323-24
TM 55-1500-204-25/1

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers L545 and R545 removed
11-4-25	Stabilator actuator removed

NOTE

This task is typical for both ends of the stabilator actuator.



A. **DISASSEMBLY**

1. Measure and record distance between key washer (1) and base of clevis (2) on actuator (3).
2. **Remove clevis (1) from actuator (3).**
   a. Remove lockwire.
   b. Hold clevis (2) and loosen nut (4). Use open-end wrench.
   c. Hold actuator (3). Remove clevis (2) and key washer (1).
   d. Remove nut (4) from clevis (2).

GO TO NEXT PAGE

11-4-39. STABILATOR ACTUATOR DISASSEMBLY/ASSEMBLY (cont) 11-4-39

2. **Remove actuator (3) from actuator (5).**

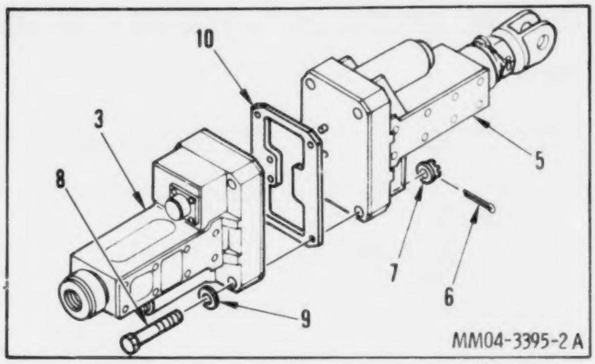
   a. Remove sealing compound. Use putty knife.

   b. Remove and discard four cotter pins (6).

   c. Hold four bolts (7).

   d. Remove four bolts (8) and washers (9).

   e. Pull actuator (3) and actuator (5) apart. Remove spacer (10).



B. **CLEANING**

1. **Wipe removed and attaching parts with a clean rag.**

2. **Clean actuators** (para 1-5-36).

C. **INSPECTION**

1. **Check clevis, actuators, and nut for stripped threads and cracks.** None allowed.

2. **Check actuators for damaged connectors** (TM 55-1500-323-24).

3. **Check all removed parts for corrosion** (para 1-5-38).

D. **ASSEMBLY**

1. **Install spacer (10) on actuator (5).**

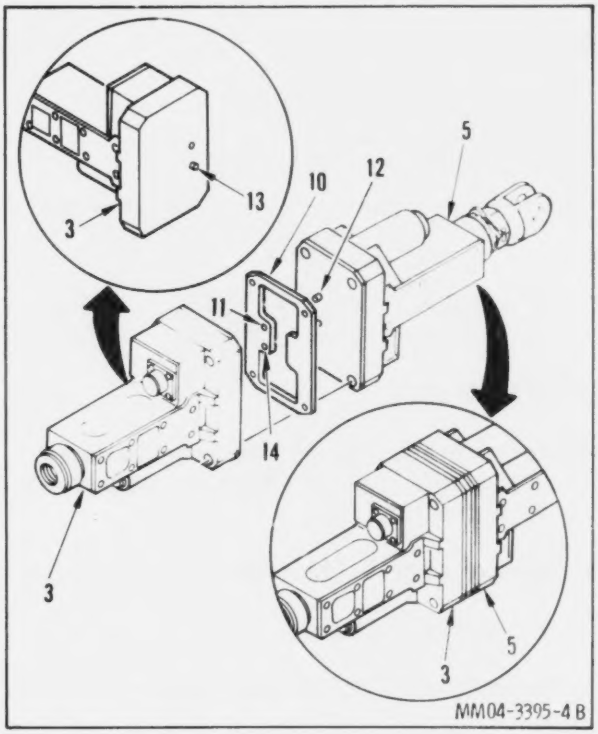
   a. Aline hole (11) in spacer (10) with locating pin (12) on actuator (5).

   b. Install spacer (10) on actuator (5).

2. **Assemble two actuators (3) and (5).**

   a. Aline locating pin (13) on actuator (3) with locating hole (14) in spacer (10).

   b. Place actuators (3) and (5) together.



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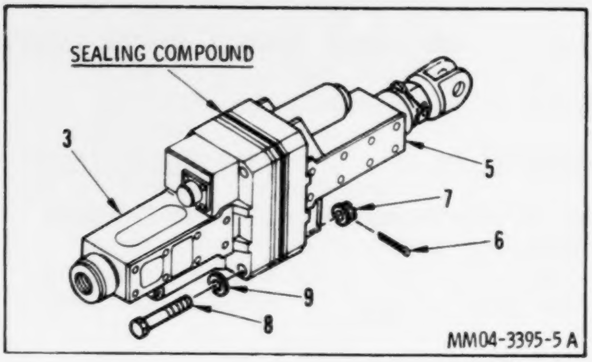
NOTE

Two additional washers may be used under each nut for proper cotter pin alinement (TM 55-1500-204-25/1).

c. Install four bolts (8) through four washers (9), and actuators (2) and (5).

d. Install four nuts (7).

e. Install four new cotter pins (6).



3. **Seal around edge of spacer (10) and mating surface of actuators (3) and (5).** Use sealing compound (E127).

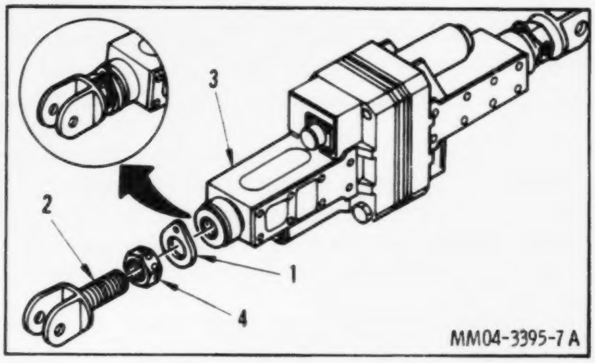
4. **Install and adjust clevis (2) on actuator (3).**

a. Install nut (4) on clevis (2). Do not tighten.

b. Install key washer (1) on clevis (2).

c. Screw clevis (2) into actuator (3) until measurement between key washer (1) and base of clevis matches measurement taken at beginning of task.

d. Hand tighten nut (4).



5. **Torque nut (4) to 300 INCH-POUNDS.** Hold clevis (2). Torque nut (4) to **300 INCH-POUNDS.** Use crowfoot.

6. **INSPECT (TI).**

7. **Lockwire nut (4) to key washer (1).** Use lockwire (E29).

8. **Inspect (TI).**

9. **Install stabilator actuator on helicopter** (para 11-4-25).

10. **Rig stabilator** (para 11-6-19).

11. **Secure access covers L545 and R545** (para 2-2-2).

END OF TASK

Section V. DIRECTIONAL CONTROL SYSTEM MAINTENANCE

11-5-1. DIRECTIONAL CONTROL SYSTEM INSPECTION 11-5-1

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Scale, Spring	6635-00-578-5285
Indicator, Dial	5218-00-277-8840

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels B60, B65L, B65R, and L200 removed; fairings T355, R410, R475, L510, L530, and L540 removed; doors T250L, T250R, T290L, T290R, and L325 opened
2-3-10	Catwalk center section removed
	Gun turret removed

Personnel Required:

67R10	Attach Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 9-1090-208-23-1
TM 55-1500-204-25/1

1. **General.** Dents, gouges, scratches, or corrosion in control rods, bellcranks, brackets, supports, idlers, and other components:

   a. Damage in dug component bore within 1 and 1/2 times bore diameter is not to exceed **10% of material thickness or 0.040-INCH,** whichever is less.

   b. Damage in bulkhead or deck attachment area is not to exceed **25% of item area and no more than 20% of material thickness** after repair.

2. Control rods.

   a. Straightness must be within **0.030-INCH.**

   b. Damage depth is not to exceed **0.010-INCH or 10% of wall thickness, whichever is less.** Damage length must not exceed

   c. Scratches and gouges not to exceed **1/3 circumference of the rod after repair.**

   d. Refer to TM 55-1500-204-25/1 for additional limits.

3. Drive links (scissors). Load-bearing maximum allowable axial play - **0.010-INCH.**

4. **Bushings and bearings.** Maximum wear limits:

   a. Radial play with bolt in bushing or bearing inside diameter -**0.004-INCH.**

   b. Radial play with sliding bushing in flanged inside diameter -**0.004-INCH.**

   c. Radial play in ball bearing - **0.002-INCH.**

   d. Radial play of Teflon bearing **0.006-INCH.**

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5. **Pitch link assembly.**

   a. Gouges and scratches depth not to exceed **0.003-INCH.** Length not to exceed **0.025-INCH.**

   b. Rod end threads should be snug but free to turn in barrel.

   c. Maximum allowable radial play - **0.011-INCH.**

   d. Maximum allowable axial play - **0.020-INCH.**

6. **Swashplate.**

   a. Bolt holes maximum allowable elongation - **0.002-INCH.**

   b. Nicks and scratches to **0.030-INCH** maximum depth must be blended out.

   c. Rod end tang nicks and scratches to **0.015-INCH** maximum depth must be blended out.

NOTE

Tailrotor swashplate inspection for freeplay measurement must be performed upon installation of any replacement swashplate assembly.

7. **Tailrotor swashplate inspection.** Perform freeplay measurement check (both bolt heads of bellcrank must be check for freeplay).

   a. Visually check tailrotor clevis ring for any evidence of cracking, especially in the areas of the six attaching bolts. Check the six attaching bolts for torque stripe integrity.

   b. If cracks are present around bolt heads or if torque stripe integrity has been disturbed the tailrotor swashplate shall be replaced.

   c. If torque stripes are not disturbed and cracks are not noted, proceed with freeplay measurement check.

WARNING

This inspection requires the use of hydraulic power and the movement of flight control surfaces. Exercise extreme caution when accomplishing these procedures to prevent personal injury. It is recommended that voice communications be established between cockpit and person making inspection. If injury occurs seek medical aid.

CAUTION

Insure that dial indicator support/clamp does not interfere with safe operation of the swashplate over its full range of travel.

NOTE

If using a dial indicator to read freeplay of bolt head relative to clevis ring lug, indicator support may be clamp mounted to the tail rotor deice slip housing or a stationary point.

   d. Connect hydraulic power (para 1-7-18).

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NOTE

A dial indicator is the preferred method of measuring clevis ring freeplay.

e. When using dial indicator for measurement, place tail rotor swashplate in the midtravel position. Fully retract swashplate and zero the dial indicator. Fully extend swashplate and read dial indicator to obtain amound of freeplay. Repeat measurement on opposite side.

f. When using mechanic scale for measurement place tail rotor swashplate in the midtravel position, fully retract swashplate and place a removable slip mark (do not scribe) on bolt and clevis. Fully extend the swashplate and measure distance of relative freeplay between bolt head and clevis ring lug. Repeat measurement on opposite side.

g. If freeplay measurements are:

(1) 0.020 inch or less, every 150 hours.

(2) 0.021 to 0.050 inch, inspect at each 10 HOUR/14 DAY INSPECTON.

(3) More than 0.050 inch, replace tail rotor swashplate assembly.

h. Disconnect hydraulic power (para 1-7-18).

8. Inspection prior to removal of tail rotor swashplate for noisy or rachety condition.

NOTE

This inspection will be performed on all four tail rotor blade assemblies.

a. Remove pitch control link from blade pitch horn (para 5-3-3).

b. Attach spring scale to blade pitch horn. Pulling perpendicular to pitch arm, measure force required to rotate blade on hub.

c. If force required is less than 25 pounds, install pitch control link on blade pitch horn (para 5-3-4) and accomplish steps a. (1) and (2) for remaining blades.

d. If force required is 25 pounds or more repair or replace using the following procedures:

(1) Remove tail rotor blade assembly (para 5-3-3).

(2) Using scotchbrite (E112), clean contaminants (lightly abrade) from inside diameter of outer bearing sleeve, inner bearing sleeve and spindle bearing surafaces.

(3) Wipe bearing surfaces with clean, dry, lintfree cloth (E32) to remove any scotchbrite residue.

(4) Reinstall tail rotor blade assembly (para 5-3-4) and reaccomplish pitch change force test (step a).

(5) If force required is less than 25 pounds, complete installation of tail rotor blade assemblies (para 5-3-4).

GO TO NEXT PAGE

(6) If force required is still 25 pounds or more, replace tail rotor blade assembly.

e. Swashplate assembly, slider force pull test and inspection.

Accomplish the following:

NOTE

- Special inspection number (5-3-1) shall be accomplished during a tail rotor swashplate installation.
- To perform the tail rotor swashplate slider force pull test, it is necessary to fabricate a two leg (equal length) sling for attachment of the force scale and swashplate assembly. Legs should be approximately 12 inches long and made from suitable strength safety wire or fine stranded aircraft cable.

(1) Disconnect nonrotating swashplate from bellcrank (para 11-5-2).

(2) Attach spring scale to swashplate and measure force required to move swashplate assembly axially on static mast.

(a) If force required to move swashplate is less than 25 pounds, accomplish the swashplate assembly clearance inspection.

(b) If force required to move swashplate is 25 pounds or more, perform the following:

1 Remove swashplate assembly (para 11-5-2).

2 Using scotchbrite (E145), lightly abrade slider bearings.

3 Remove scotchbrite residue by wiping bearing surfaces with clean, dry, lintfree cloth (E32).

4 Reinstall swashplate assembly (para 11-5-2).

5 Perform slider force test (step b).

6 If force required is still 25 pounds or more replace swashplate assembly (para 11-5-2).

(3) Swashplate assembly clearance inspection.

(a) Check static mast to swashplate clearance by inserting a feeler gage between the static mast and sawshplate bearing. Do not attempt to move the swashplate while taking this measurement. If clearance is more than **0.011 INCH**, replace swashplate assembly.

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(b) Clearance up to 0.011 inch may allow some swashplate movement; this movement is acceptable.

(4) Swashplate assembly movement inspection.

(a) Check swashplate assembly by moving it with an up and down motion.

(b) If any internal or unusual contact sounds are heard, replace swashplate assembly.

(5) If these inspections are acceptable, reattach the nonrotating swashplate to the bellcrank (para 11-5-2) and reattach the pitch control links to the pitch horn (para 5-3-4).

9. Inspect for freeplay/smoothness of operation of tail rotor swashplate at 150 hours and 200 hours of operation.

a. Disconnect tail rotor pitch links (4 places) from tail rotor swashplate (para 11-5-11).

b. Remove tail rotor drive link assemblies (para 11-5-12).

c. Inspect tail rotor swashplate for axial play and smoothness of rotation. Turn swashplate at least 180 degrees.

d. If any play, roughness, noise, or excessive drag is evident at any point, remove and replace swashplate assembly.

e. Reinstall tail rotor drive link assemblies (para 11-5-13).

f. Reconnect tail rotor pitch link assemblies (para 11-5-11).

END OF TASK

11-5-2. TAIL ROTOR SWASHPLATE REMOVAL/INSTALLATION 11-5-2

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Gasket
Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
5-3-3	Tail rotor blades removed
11-5-11	Tail rotor pitch link removed
11-5-12	Tail rotor drive links removed
5-3-8	Tail rotor head removed

A. REMOVAL

NOTE

To replace the tail rotor swashplate only, cut the de-ice wire harness as close as possible to swashplate and go to step 2. Do step 1 if the tail rotor swashplate will be removed and reinstalled.

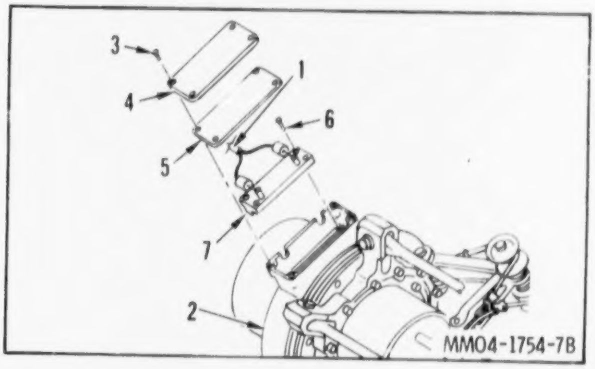
1. **Detach two de-ice wire harnesses (1) from swashplate (2).**

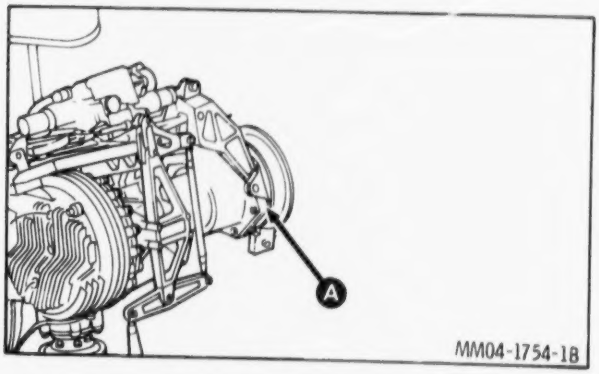
   a. Remove four screws (3) from cover (4).

   b. Remove cover (4) and gasket (5). Discard gasket (5).

   c. Remove four screws (6) from terminal board (7).

   d. Remove terminal board (7), with de-ice wire harnesses (1) attached, from swashplate (2).





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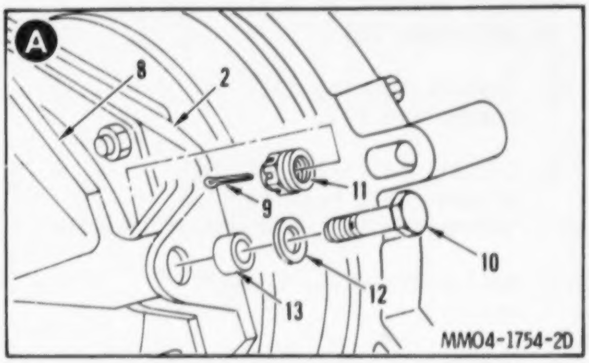
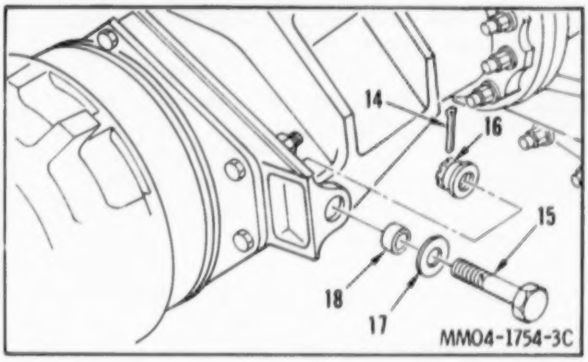
11-5-2. TAIL ROTOR SWASHPLATE REMOVAL/INSTALLATION (cont) 11-5-2

2. **Disconnect swashplate (2) from bellcrank (8).**
   a. Remove and discard cotter pin (9).
   b. Hold bolt (10). Remove nut (11).
   c. Remove bolt (10), washer (12), and bushing (13).
   d. Opposite side of non-rotating swashplate (2): Remove cotter pin (14).
   e. Hold bolt (15). Remove nut (16).
   f. Remove bolt (15), washer (17), and bushing (18).
3. **Remove swashplate (2).** Pull swashplate (2) clear of tail rotor drive shaft (19).



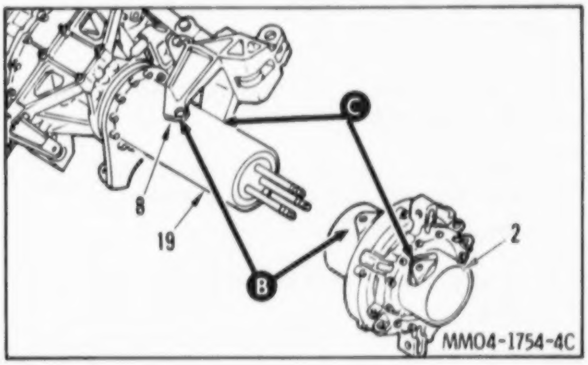


B. CLEANING

Wipe attaching surfaces of swashplate with a clean rag.

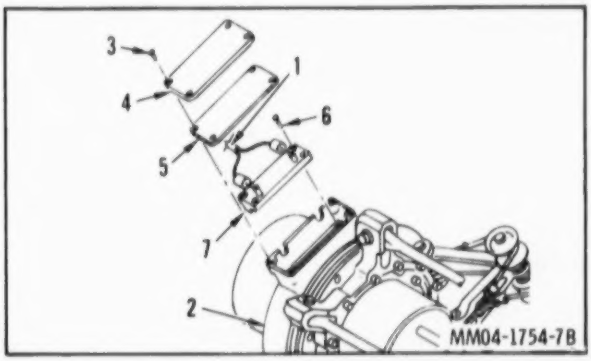
C. INSPECTION

1. **Check swashplate attaching points for cracks, nicks, and scratches.**
   a. Nicks and scratches to **0.030-inch** maximum depth must be blended out.
   b. Rod end tang nicks and scratches to **0.015-inch** maximum depth must be blended out.
2. **Check for corrosion** (para 1-5-38).



D. INSTALLATION

1. **Position swashplate (2) on tail rotor drive shaft (19).** Aline swashplate (2) with bellcrank (8).



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2. **Connect bracket of swashplate (2) to bellcrank (8).**

   a. Install bushing (13) in swashplate (2).

   b. Install bolt (10) through washer (12), bushing (13), swashplate (2), and bellcrank (8).

   c. Hold bolt (10). Install nut (11).

   d. Opposite side of swashplate (2): Connect bracket of swashplate (2) to bellcrank (8).

   e. Install bushing (18) in swashplate (2).

   f Install bolt (15) through washer (17), bushing (18), swashplate (2), and bellcrank (8).

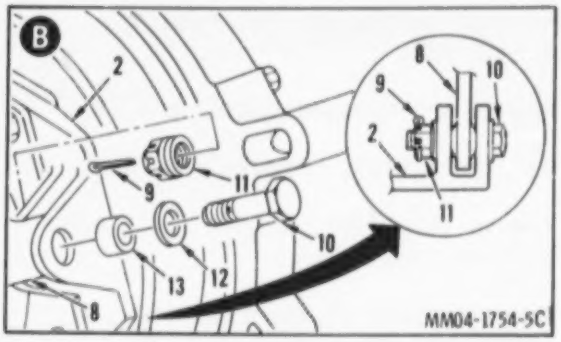
   g. Hold bolt (15). Install nut (16).

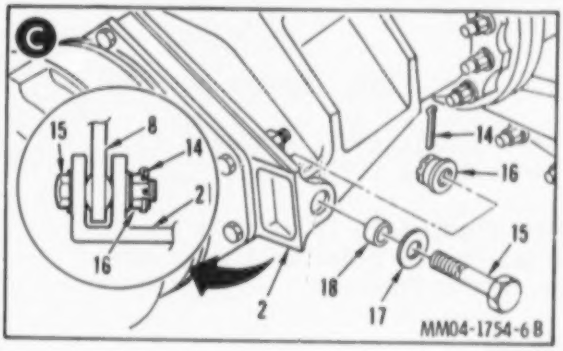
3. **Torque nuts (11) and (16) 65 to 85 INCH-POUNDS.** Hold bolts (10) and (15).

   a. Torque nuts (11) and (16) to **65 INCH-POUNDS.**

   b. Increase torque to aline cotter pin holes, but do not exceed **85 INCH-POUNDS.**

   c. Install new cotter pins (9) and (14).





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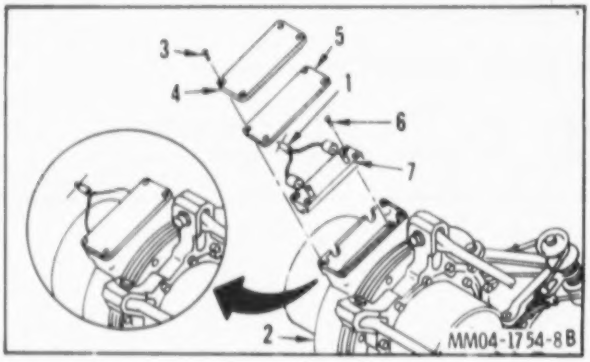
11-5-2. TAIL ROTOR SWASHPLATE REMOVAL/INSTALLATION (cont) 11-5-2

NOTE

Splice de-ice wire harness to clipped wires of W171 if a new swashplate is being installed and go to step 5.

4. **Attach two harnesses (1) to swashplate (2).**
   a. Install terminal board (7), with harnesses (1) attached, to swashplate (2).
   b. Install four screws (6) on terminal board (7).
   c. Install new gasket (5) and cover (4).
   d. Install four screws (3) on cover (4).



5. **Install tail rotor head** (para 5-3-9).
6. **Install tail rotor drive links** (para 11-5-13).
7. **Install tail rotor outboard pitch links** (para 11-5-11).
8. **Install tail rotor blades** (para 5-3-4).
9. **Inspect (TI).**
10. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-3. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK REMOVAL 11-5-3

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. REPAIR

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

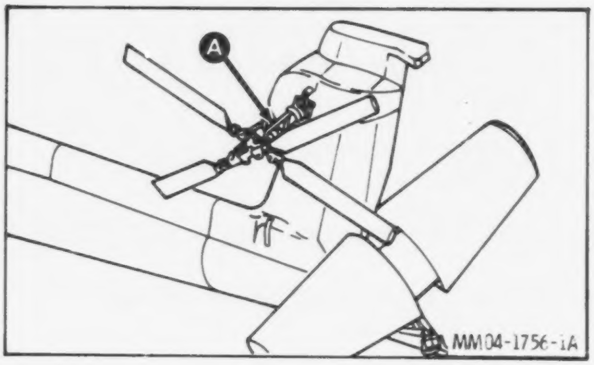
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

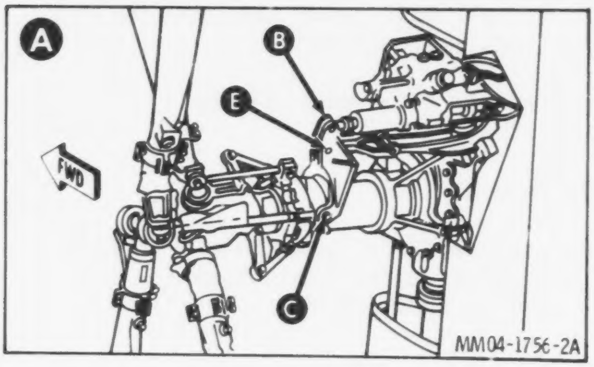
References:

TM 55-1500-322-24

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





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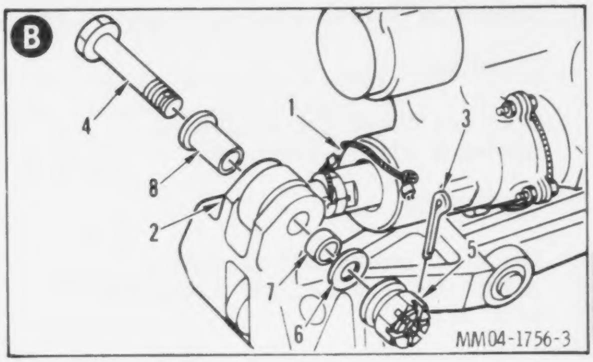
11-5-3. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK REMOVAL (cont) 11-5-3

A. REMOVAL

1. **Remove directional servocylinder (1) from bellcrank (2).**
   - a. Remove and discard cotter pin (3).
   - b. Hold bolt (4). Remove nut (5), washer (6) and bushing (7).
   - c. Remove bolt (4) and pin (8).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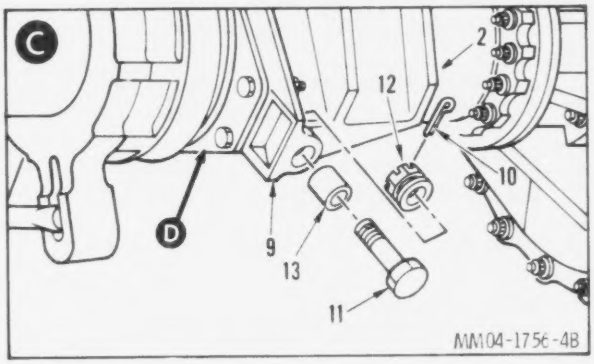
2. **Disconnect bellcrank (2) from swashplate (9).**
   - a. Remove and discard cotter pin (10).
   - b. Hold bolt (11). Remove nut (12).
   - c. Remove bolt (11) and bushing (13).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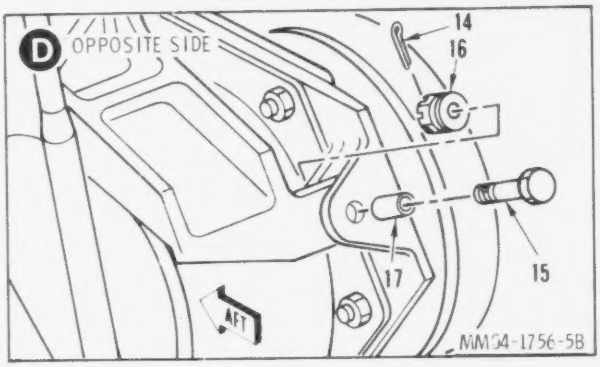
   - d. Remove and discard cotter pin (14).
   - e. Hold bolt (15). Remove nut (16).
   - f. Remove bolt (15) and bushing (17).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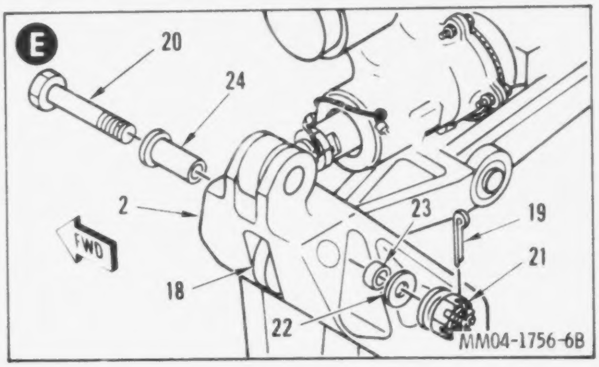
3. **Disconnect bellcrank (2) from link (18).**
   - a. Remove and discard cotter pin (19).
   - b. Hold bolt (20). Remove nut (21), washer (22), and bushing (23).
   - c. Remove bolt (20) and pin (24).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4. Remove bellcrank (2).

B. CLEANING

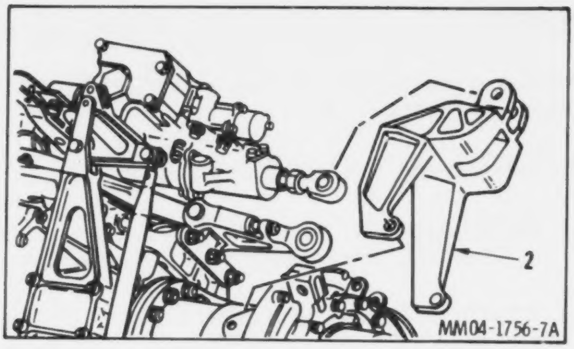
Wipe bellcrank and attaching hardware with a clean rag.

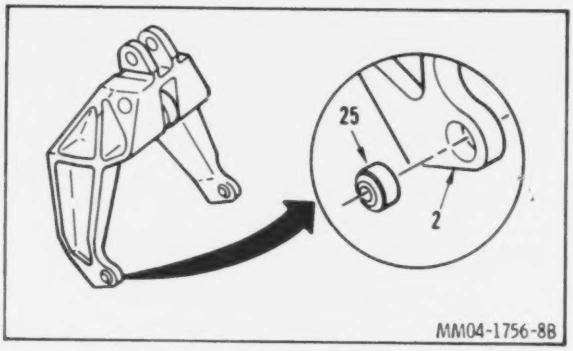
C. INSPECTION

1. Check bellcrank and attaching points for cracks, and elongated bolt holes.
   - a. Bolt holes maximum allowable elongation is 0.002-inch.
   - b. Swashplate maximum allowable radial play is 0.002-inch.
2. Check bellcrank and attaching parts for corrosion (para 1-5-38).

D. REPAIR

1. Repair bellcrank (2) by replacing bearings (25) (TM 55-1500-322-24).
2. Inspect (TI).





END OF TASK

11-5-4. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK INSTALLATION 11-5-4

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489
Wrench, Torque 3/8 Drive	5120-00-288-8865

Materials/Parts:

Cotter Pin (4)

Personnel Required:

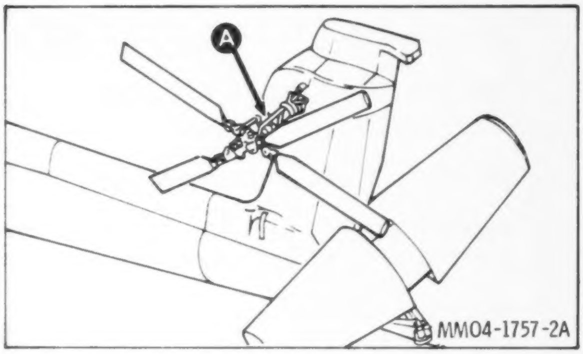
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

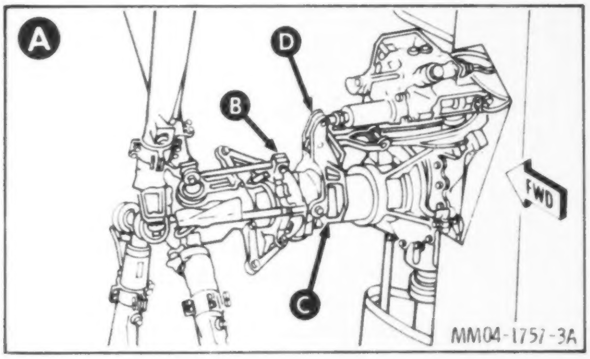
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





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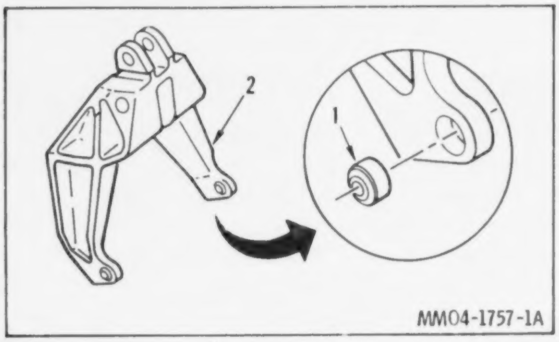
11-5-4. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK INSTALLATION (cont) 11-5-4

1. **Install bearing (1) in bellcrank (2).**



2. **Connect bellcrank (2) to link (3).**

   a. Aline bellcrank (2) with link (3), swashplate (4), and servocylinder (5).

   b. Position link (3) in bellcrank (2).

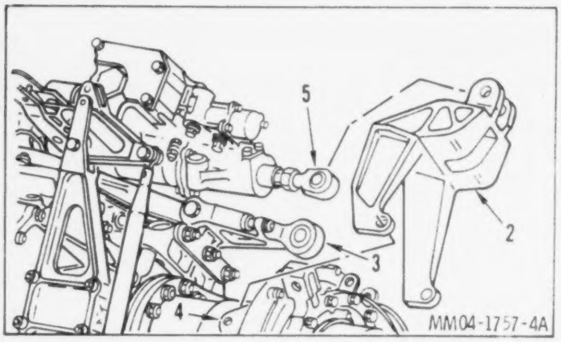
   c. Insert bushing (6) in aft side of bellcrank (2).

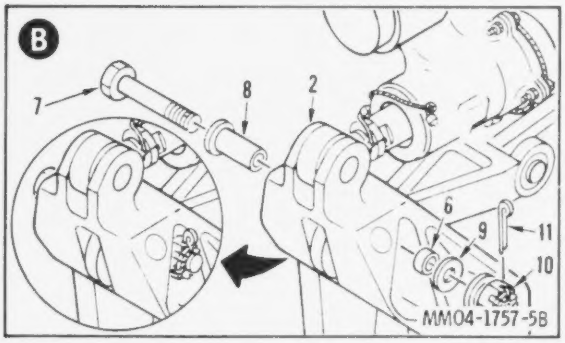
   d. Insert bolt (7) through pin (8).

   e. Insert bolt (7) with pin (8) in forward side of bellcrank (2).

   f. Check fit of self-retaining bolt (7) (para 11-2-1).

   g. Install washer (9) and nut (10) on bolt (7).





3. **Torque nut (10) 85 to 115 INCH-POUNDS.**

   a. Hold bolt (7).

   b. Torque nut (10) to **85 INCH-POUNDS.** Use 1/4 drive torque wrench.

   c. Increase torque to aline cotter pin holes, but do not exceed **115 INCH-POUNDS.**

   d. Install new cotter pin (11).

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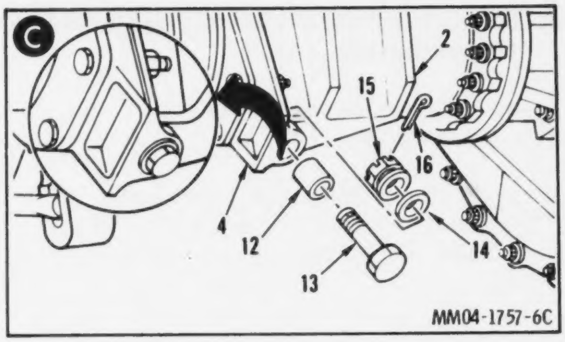
11-5-4. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK INSTALLATION (cont) 11-5-4



4. **Connect aft side of bellcrank (2) to swashplate (4).**
   - a. Install bushing (12) in swashplate (4).
   - b. Install bolt (13) through swashplate (4), bushing (12), and bellcrank (2).
   - c. Hold bolt (13). Install washer (14) and nut (15).
5. **Torque nut (15) 65 to 85 INCH-POUNDS.**
   - a. Hold bolt (13).
   - b. Torque nut (15) to **65 INCH-POUNDS.** Use 1/4 drive torque wrench.
   - c. Increase torque to aline cotter pin holes, but do not exceed **85 INCH-POUNDS.**
   - d. Install new cotter pin (16).

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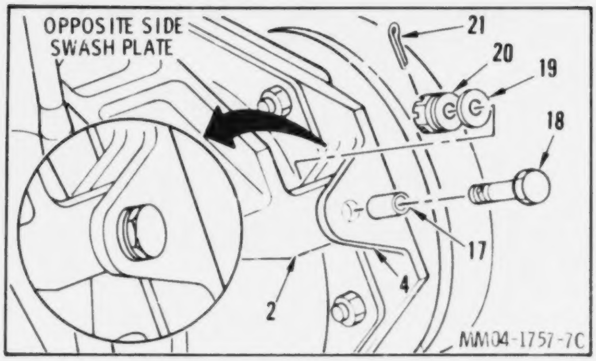
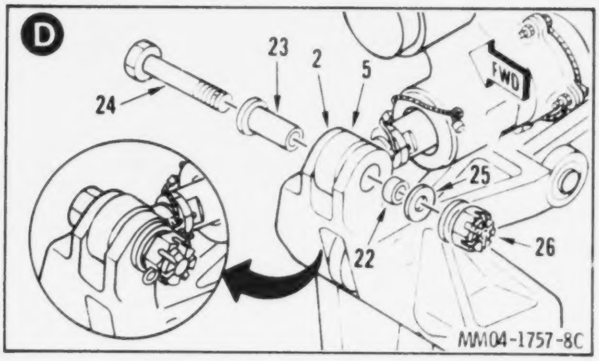
11-5-4. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK INSTALLATION (cont) 11-5-4



6. **Connect forward side of bellcrank (2) to swashplate (4).**
   - a. Install bushing (17) in swashplate (4).
   - b. Install bolt (18) through swashplate (4), bushing (17), and bellcrank (2).
   - c. Hold bolt (18). Install washer (19) and nut (20).
7. **Torque nut (20) 65 to 85 INCH-POUNDS.**
   - a. Hold bolt (18).
   - b. Torque nut (20) to **65 INCH-POUNDS.** Use 1/4 drive torque wrench.
   - c. Increase torque to aline cotter pin holes, but do not exceed **85 INCH-POUNDS.**
   - d. Install new cotter pin (21).
8. **Connect bellcrank (2) to servocylinder (5).**
   - a. Position servocylinder (5) in clevis of bellcrank (2).
   - b. Insert bushing (22) in aft side of bellcrank (2).
   - c. Insert bolt (24) through pin (23).
   - d. Insert bolt (24) with pin (23) in bellcrank (2).
   - e. Check fit of bolt (24) (para 11-2-1).
   - f. Install washer (25) and nut (26) on bolt (24).



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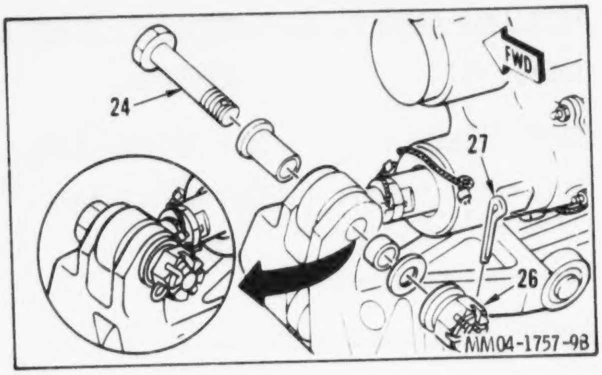
11-5-4. TAIL ROTOR SWASHPLATE CONTROL BELLCRANK INSTALLATION (cont) 11-5-4



9. **Torque nut (26) 225 to 285 INCH-POUNDS.**
   - a. Hold bolt (24).
   - b. Torque nut (26) to **225 INCH-POUNDS.** Use 3/8 drive torque wrench.
   - c. Increase torque to aline cotter pin holes, but do not exceed **285 INCH-POUNDS.**
   - d. Install new cotter pin (27).
10. **Inspect (TI).**
11. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-5. TAIL ROTOR BELLCRANK LINK REMOVAL 11-5-5

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

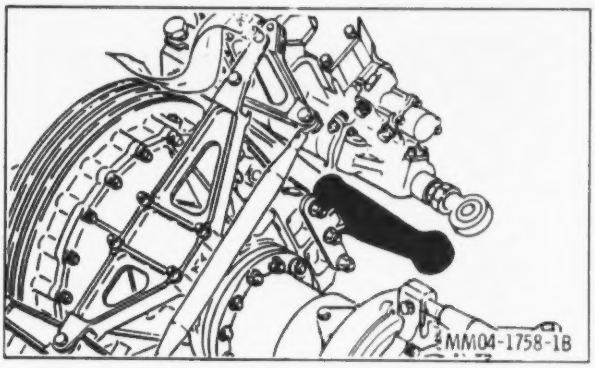
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

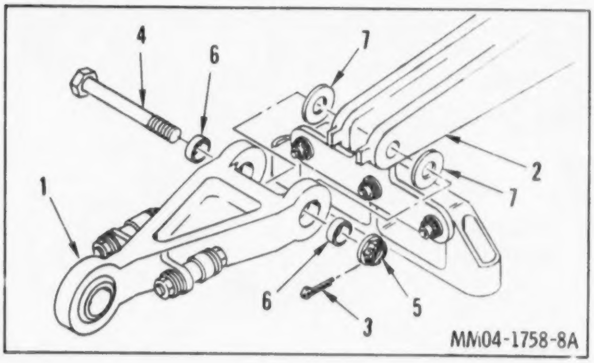
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L530 and L540 removed
11-5-3	Tail rotor swashplate control bellcrank removed





A. REMOVAL

1. **Disconnect link (1) from support (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4), two bushings (6), and two washers (7).

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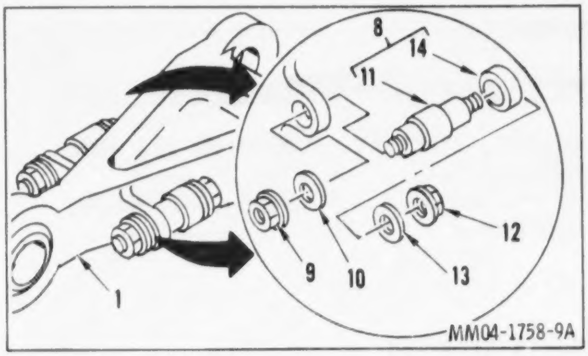
2. **Remove two roller pins (8) from link (1).**

   a. Remove nut (9) and washer (10) from pin (11).

   b. Remove pin (11) from link (1).

   c. Remove nut (12) and washer (13) from pin (11).

   d. Remove roller (14) from pin (11).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check link, support, and attaching parts for damage** (para 11-5-1).

2. **Check link, support, and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-6. TAIL ROTOR BELLCRANK LINK INSTALLATION 11-5-6

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-288-8865

Materials/Parts:

Cotter Pin

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

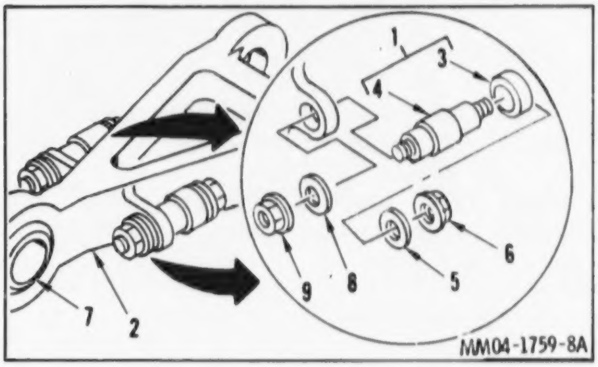
References:

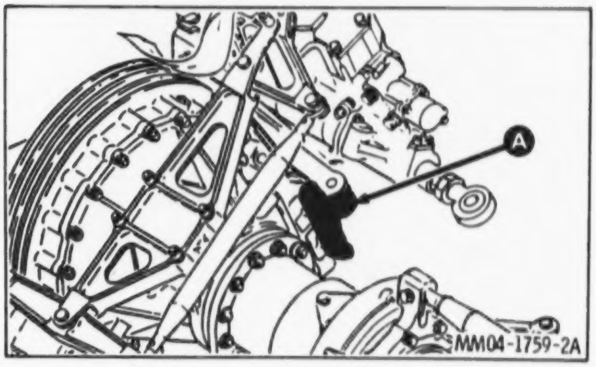
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. Install two roller pins (1) on link (2).
   a. Slide roller (3) on pin (4).
   b. Hold pin (4). Install washer (5) and nut (6).
   c. Install pin (4) on link (2) with roller (3) away from self-alining bearing (7).
   d. Hold pin (4). Install washer (8) and nut (9).





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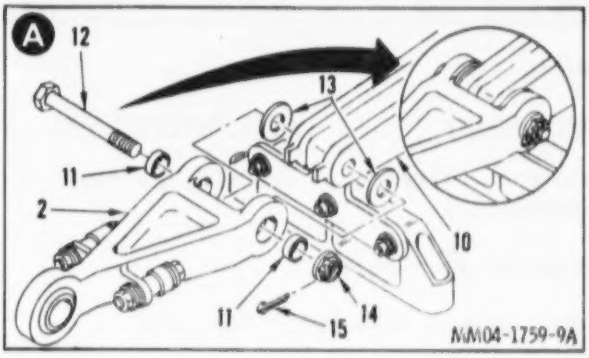
11-5-6. TAIL ROTOR BELLCRANK LINK INSTALLATION (cont) 11-5-6



2. **Connect link (2) to support (10).**
   - a. Aline link (2) with support (10).
   - b. Install two bushings (11) in link (2).
   - c. Insert bolt (12) through two bushings (11), link (2), two washers (13), and support (10).
   - d. Hold bolt (12). Install nut (14).
3. **Torque nut (14) 225 to 285 INCH-POUNDS.**
   - a. Hold bolt (12).
   - b. Torque nut (14) to **225 INCH-POUNDS.**
   - c. Increase torque to aline cotter pin holes, but do not exceed **285 INCH-POUNDS.**
   - d. Install new cotter pin (15).
4. **Inspect (TI).**
5. **Install tail rotor swashplate control bellcrank** (para 11-5-4).
6. **Secure fairing L530 and L540** (para 2-2-2).
7. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-7. DIRECTIONAL FS 520 PUSH-PULL ROD REMOVAL 11-5-7

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

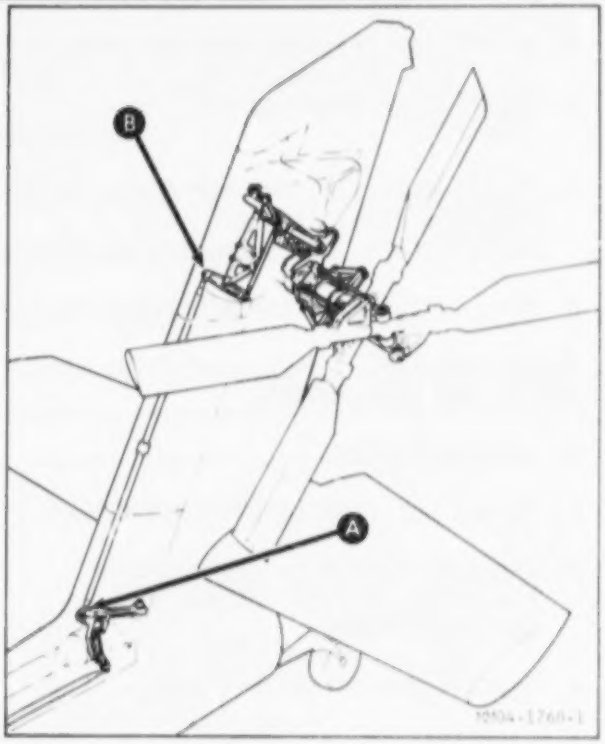
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

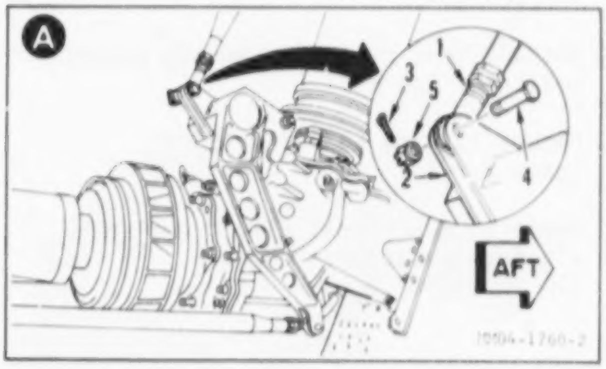
Personnel Required:

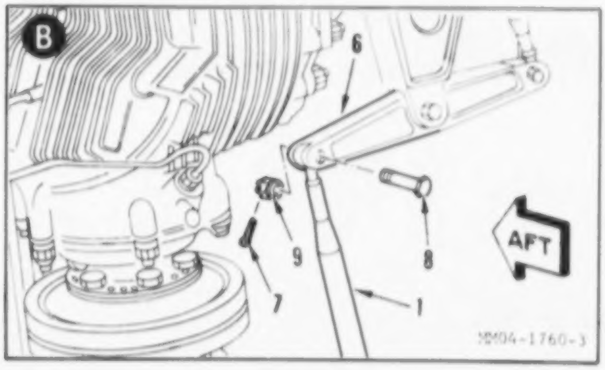
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L510 and L530 removed







A. REMOVAL

1. **Disconnect push-pull rod (1) from lower bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4).
2. **Disconnect push-pull rod (1) from upper bellcrank (6).**
   a. Remove and discard cotter pin (7).
   b. Hold bolt (8). Remove nut (9).
   c. Remove bolt (8).
   d. Remove push-pull rod (1).

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11-5-7. DIRECTIONAL FS 520 PUSH-PULL ROD REMOVAL (cont) 11-5-7

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check push-pull rod, upper and lower bellcranks, and attaching parts for damage (para 11-4-1).
2. Check push-pull rod, upper and lower bellcranks, and atttaching parts for corrosion (para 1-5-38).

END OF TASK

11-5-8. DIRECTIONAL FS 520 PUSH-PULL ROD INSTALLATION 11-5-8

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Connect adjustable end of push-pull rod (1) to lower bellcrank (2). Torque nut (4) 30 to 40 INCH-POUNDS.**

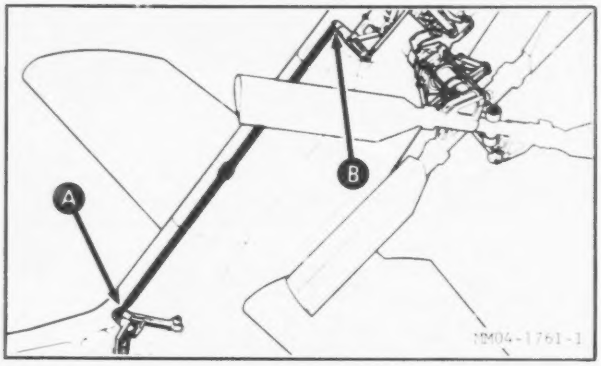
   a. Aline push-pull rod (1) with bellcrank (2).

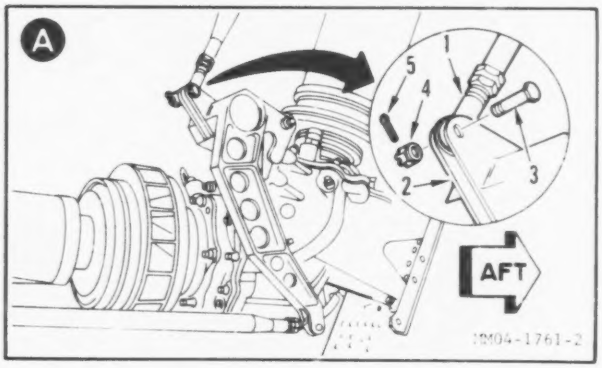
   b. Insert bolt (3) through bellcrank (2) and push-pull rod (1).

   c. Hold bolt (3). Install nut (4). Torque to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (5).





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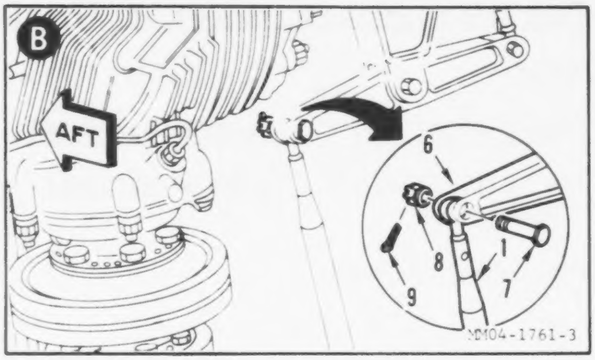
11-5-8. DIRECTIONAL FS 520 PUSH-PULL ROD INSTALLATION (cont) 11-5-8



2. **Connect push-pull rod (1) to upper bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS.**
   a. Aline push-pull rod (1) with bellcrank (6).
   b. Insert bolt (7) through bellcrank (6) and push-pull rod (1).
   c. Hold bolt (7). Install nut (8). Torque to **30 INCH-POUNDS.**
   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   e. Install new cotter pin (9).
3. **Inspect (TI).**
4. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).
5. **Secure access fairings L530 and L510 fairings** (para 2-2-2).

END OF TASK

11-5-9. DIRECTIONAL FS 534 PUSH-PULL ROD REMOVAL 11-5-9

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

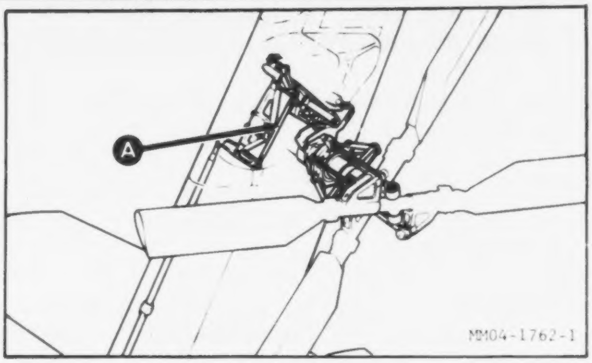
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

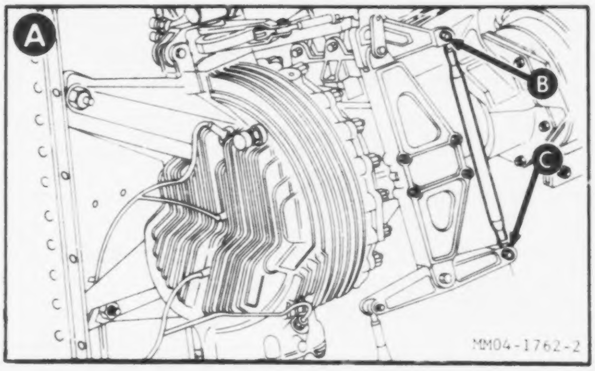
Personnel Required:

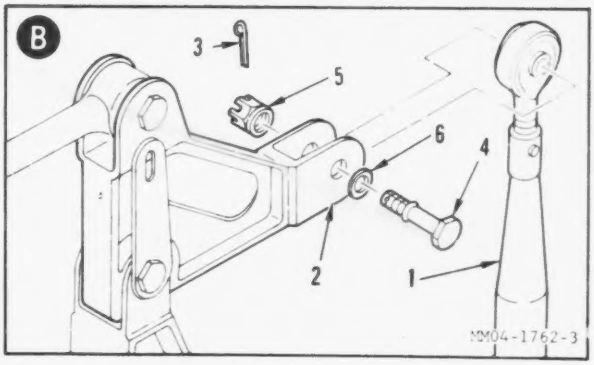
67R10 Attack Helicopter Repairer

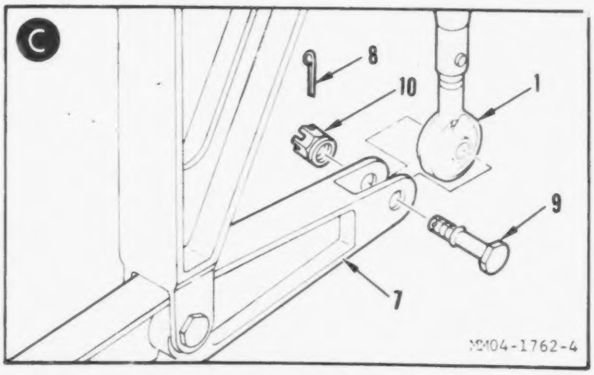
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L530 and L540 removed









A. REMOVAL

1. **Disconnect push-pull rod (1) from upper bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4) and washer (6).
2. **Disconnect push-pull rod (1) from lower bellcrank (7).**
   a. Remove and discard cotter pin (8).
   b. Hold bolt (9). Remove nut (10).
   c. Remove bolt (9).
   d. Remove push-pull rod (1).

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11-5-9. DIRECTIONAL FS 534 PUSH-PULL ROD REMOVAL (cont) 11-5-9

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check push-pull rod, upper and lower bellcranks, and attaching parts for damage (para 11-4-1).
2. Check push-pull rod, upper and lower bellcranks, and attaching parts for corrosion (para 1-5-38).

END OF TASK

11-5-10. DIRECTIONAL FS 534 PUSH-PULL ROD INSTALLATION 11-5-10

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (2)

Personnel Required:

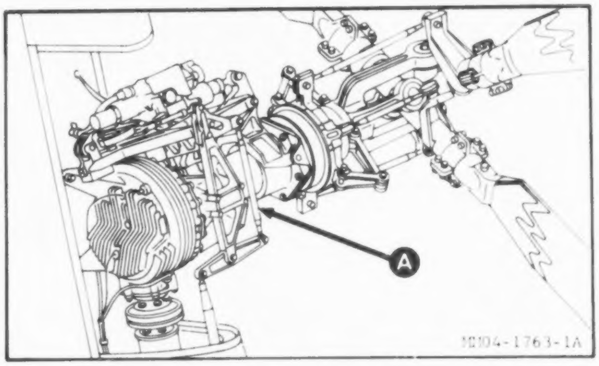
67R10	Attack Helicopter
66R30	Inspector/Supervisor

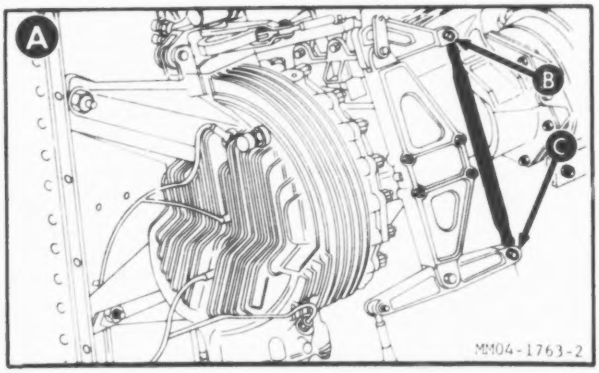
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





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11-5-10. DIRECTIONAL FS 534 PUSH-PULL ROD INSTALLATION (cont) 11-5-10

1. **Connect push-pull rod (1) to upper bellcrank (2).** Torque nut (5) **30 to 40 INCH-POUNDS.**

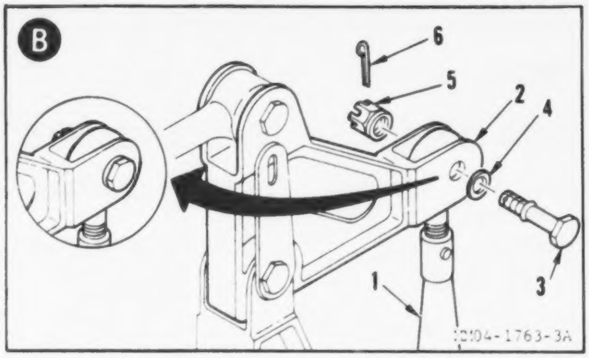
   a. Aline push-pull rod (1) with bellcrank (2).

   b. Insert bolt (3) through washer (4), bellcrank (2) and push-pull rod (1).

   c. Hold bolt (3). Install nut (5). Torque nut (5) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (6).



2. **Connect push-pull rod (1) to lower bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS.**

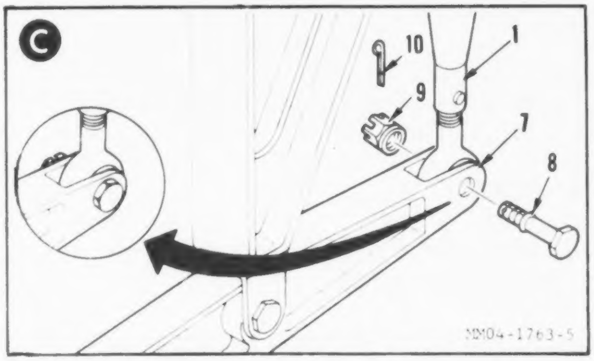
   a. Aline push-pull rod (1) with bellcrank.

   b. Insert bolt (8) through bellcrank (7) and push-pull rod (1).

   c. Hold bolt (8). Install nut (9). Torque nut (9) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (10).



3. **Inspect (TI).**

4. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

5. **Secure access fairings L530 and L540** (para 2-2-2).

END OF TASK

11-5-11. TAIL ROTOR PITCH LINK REMOVAL/INSTALLATION 11-5-11

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. REPAIR E. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-288-8865

Materials/Parts:

Cotter Pin (2)

Personnel Required:

57R10	Attack Helicopter
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 55-1500-322-24

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

NOTE

This task is typical for all four pitch links.

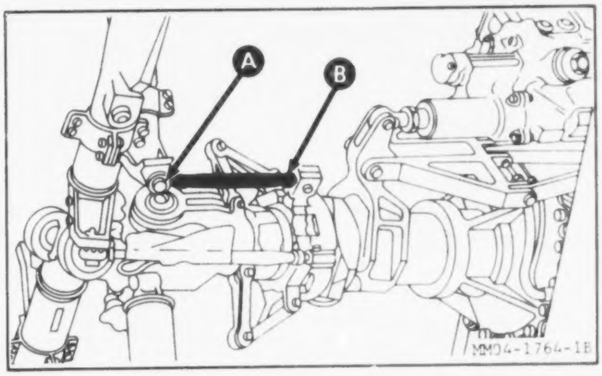
A. REMOVAL

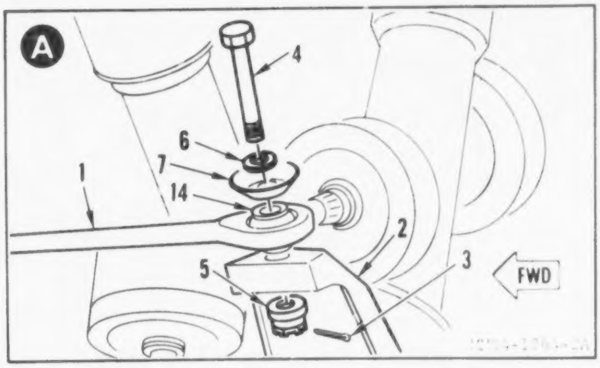
1. **Disconnect pitch link (1) from pitch horn (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), and safety washer (7).





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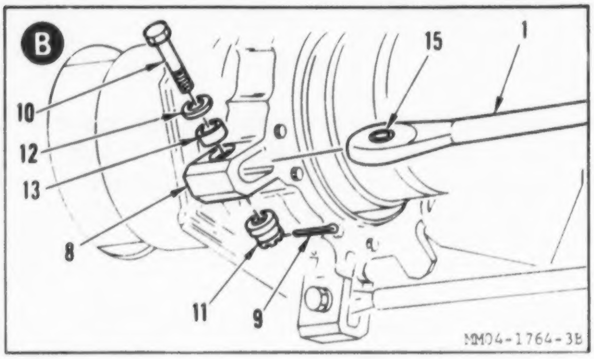
11-5-11. TAIL ROTOR PITCH LINK REMOVAL/INSTALLATION (cont) 11-5-11



2. Disconnect pitch link (1) from swashplate (8).

a. Remove and discard cotter pin (9).

b. Hold bolt (10). Remove nut (11).

c. Remove bolt (10), washer (12), and bushing (13).

B. **CLEANING**

Wipe attaching surfaces of pitch link with a clean rag.

C. **INSPECTION**

1. **Check bearings for binding or wear.**

a. Rod ends should be snug but free to turn in barrel.

b. Maximum allowable radial play - **0.011-inch.**

c. Maximum allowable axial play - **0.020-inch.**

2. **Check links for bends, scratches, or cracks.** Scratches and cracks not to exceed **0.003-inch** deep and **0.025-inch** long.

3. **Check links for corrosion** (para 1-5-38).

D. **REPAIR**

1. **Repair pitch links damaged in excess of inspection criteria by replacing pitch link.**

2. **Repair pitch link bearings which do not meet inspection criteria by replacing bearings** (TM 55-1500-322-24).

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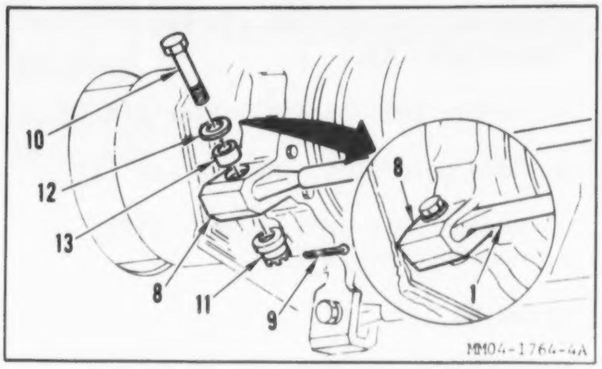
11-5-11. TAIL ROTOR PITCH LINK ASSEMBLY REMOVAL/INSTALLATION (cont) 11-5-11

E. INSTALLATION



NOTE

Install long links between outboard pitch horns and swashplate. Install short links between inboard blade pitch horns and swashplate. Install bolt heads in rotor rotation direction.

1. **Connect pitch link (1) to swashplate (8).**
   a. Aline small end of pitch link (1) with swashplate (8).
   b. Install bushing (13) in swashplate (8).
   c. Insert bolt (10) through washer (12), bushing (13), pitch link (1), and swashplate (8) (para 11-2-1).
   d. Hold bolt (10). Install nut (11).
2. **Torque nut (11) 85 to 115 INCH-POUNDS.**
   a. Hold bolt (10).
   b. Torque nut (11) to **85 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **115 INCH-POUNDS.**
   d. Install new cotter pin (9).

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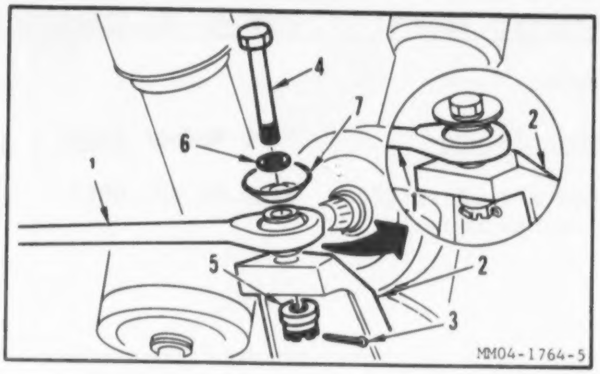
11-5-11. TAIL ROTOR PITCH LINK ASSEMBLY REMOVAL/INSTALLATION (cont) 11-5-11



3. **Connect pitch link (1) to pitch horn (2).**
   a. Aline pitch link (1) with pitch horn (2).
   b. Insert bolt (4) through washer (6), safety washer (7), pitch link (1), and pitch horn (2) (para 11-2-1).
   c. Hold bolt (4). Install nut (5).
4. **Torque nut (5) 225 to 285 INCH-POUNDS.**
   a. Hold bolt (4).
   b. Torque nut (5) to **225 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **285 INCH-POUNDS.**
   d. Install new cotter pin (3).
5. **Inspect (TI).**
6. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-12. TAIL ROTOR DRIVE LINK REMOVAL 11-5-12

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. REPAIR

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

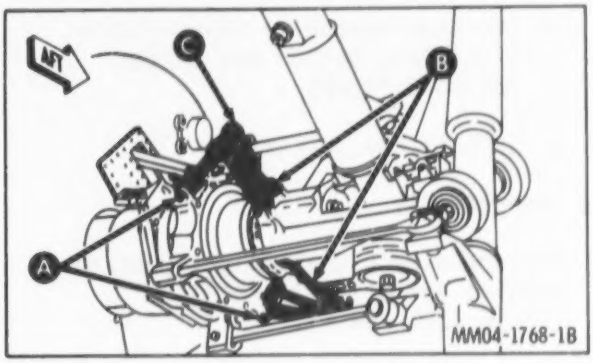
Ref	Condition
1-7-2	Helicopter safed

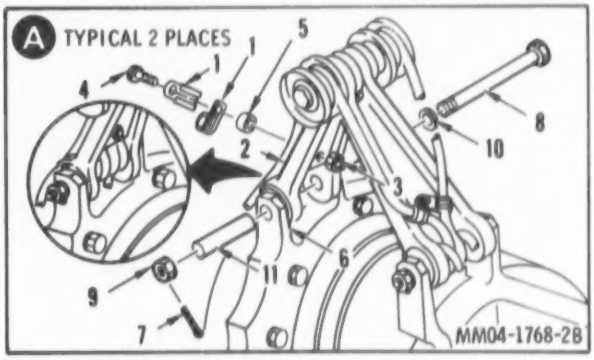
NOTE

This task is typical for both drive links.

A. REMOVAL

1. **Remove four harness clamps (1) from drive link (2).**
   a. Remove two nuts (3) from two screws (4).
   b. Remove two screws (4) and two spacers (5) from four clamps (1).
2. **Disconnect link (2) from swashplate (6).**
   a. Remove and discard cotter pin (7).
   b. Hold bolt (8).
   c. Remove nut (9).
   d. Remove bolt (8), washer (10), and bushing (11).





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11-5-12. TAIL ROTOR DRIVE LINK REMOVAL (cont) 11-5-12

3. **Disconnect link (2) from fork (12).**

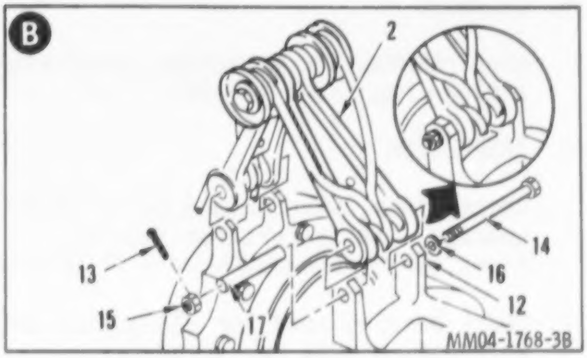
   a. Remove and discard cotter pin (13).

   b. Hold bolt (14).

   c. Remove nut (15).

   d. Remove bolt (14), washer (16), and bushing (17).

   e. Unwrap de-ice wire harnesses (18) from wire guides (19) and spacers (20).



NOTE

One drive link has three spacers installed. Opposite side has none.

4. **Separate links (21).**

   a. Remove and discard cotter pin (22).

   b. Hold bolt (23).

   c. Remove nut (25) and washer (26).

   d. Remove bolt (23), washer (24), four wire guides (19), two wire guide spacers (20), two spacers (27), bushing (28), and three spacers (29).

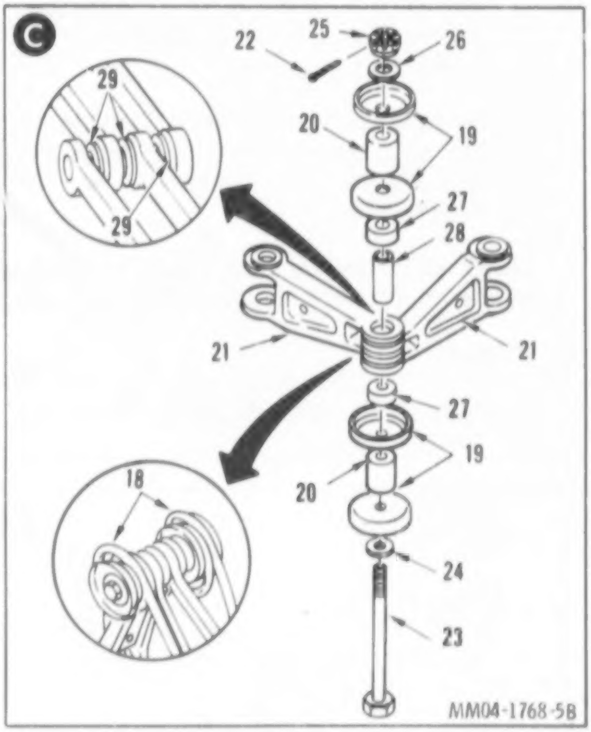
Opposite side:

   e. Remove and discard cotter pin (22).

   f. Hold bolt (23).

   g. Remove nut (25) and washer (26).

   h. Remove bolt (23), washer (24), four wire guides (19), two wire guide spacers (20), two spacers (27), and bushing (28).



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B. CLEANING

Wipe removed and attaching parts with a clean rag (para 1-5-36).

C. INSPECTION

1. Check links, wire guides, wire guide spacers, and spacers for scoring, nicks, or scratches.

2. Check bearing bore for elongation and surrounding area for scratches, cracks, and wear. Damage in a bore area within 1-1/2 times bore diameter is not to exceed 10% of the material thickness or 0.040-inch, whichever is less.

3. Check spacers and bushings for wear.

   a. Maximum allowable wear limits: Radial play with bolt in bushing or bearing inside diameter - 0.004-inch.

   b. Maximum allowable wear limits: Radial play with sliding bushing in flanged inside diameter - 0.004-inch.

4. Check all removed parts and attaching surfaces for corrosion (para 1-5-38).

D. REPAIR

Replace worn bearings (para 11-5-14).

END OF TASK

11-5-13. TAIL ROTOR DRIVE LINK INSTALLATION 11-5-13

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Repairer's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489
Platform, Maintenance	1730-00-294-8883

Materials/Parts:

Cotter Pin (3)

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

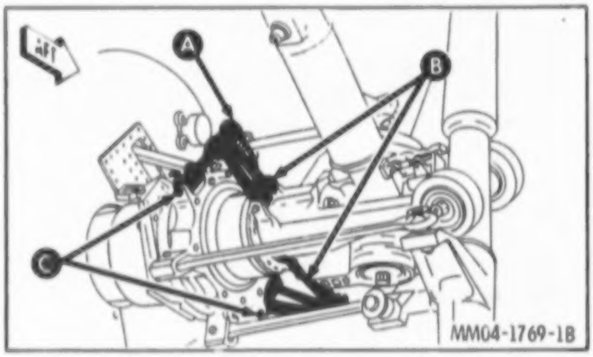
Equipment Conditions:

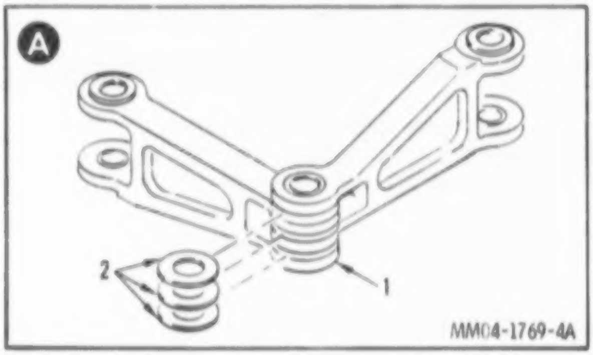
Ref	Condition
1-7-2	Helicopter safed

NOTE

This task is typical for both drive links. One drive link will contain three spacers at link coupling. The opposite link will contain no spacers at link coupling. Install all bolts in links with bolt heads in direction of rotor rotation.

1. **Couple links (1).**
   a. Aline bearing holes in narrow end of links (1).
   b. Install three spacers (2) between ears of links (1).





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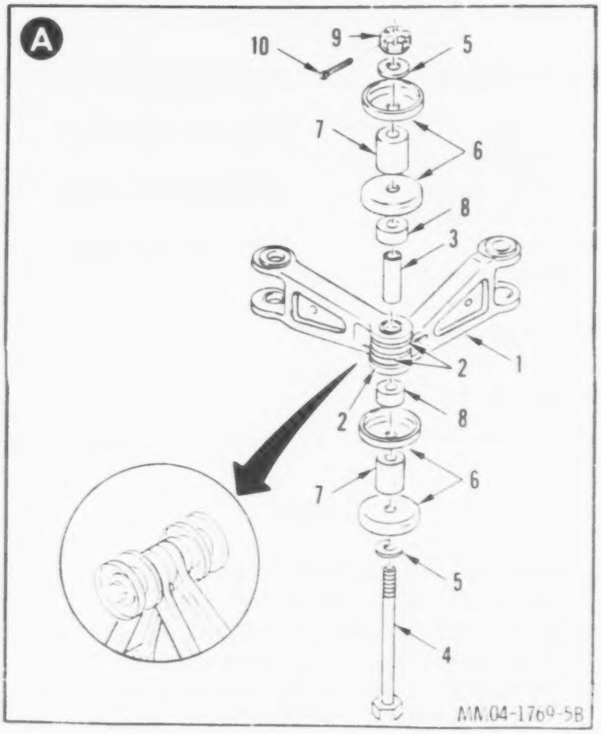
11-5-13. TAIL ROTOR DRIVE LINK INSTALLATION (cont) 11-5-13



c. Aline and insert bushing (3) through holes in eyes of links (1).

d. Insert bolt (4) through washer (5), wire guide (6), wire guide spacer (7), wire guide (6), spacer (8), and bushing (3).

e. Insert spacer (8), wire guide (6), wire guide spacer (7), wire guide (6), and washer (5) on bolt (4).

f. Hold bolt (4). Install nut (9).

Opposite side assembly:

g. Aline bearing holes in narrow end of links (1).

h. Aline and insert bushing (3) through holes in eyes of links (1).

i. Insert bolt (4) through washer (5), wire guide (6), wire guide spacer (7), wire guide (6), spacer (8), and bushing (3).

j. Insert spacer (8), wire guide (6), wire guide spacer (7), wire guide (6), and washer (5) on bolt (4).

k. Hold bolt (4). Install nut (9).

2. **Torque two nuts (9) 30 to 40 INCH-POUNDS and install new cotter pin (10).**

a. Hold bolt (4).

b. Torque nut (9) to **30 INCH-POUNDS.**

c. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

d. Install new cotter pin (10).

GO TO NEXT PAGE

11-5-13. TAIL ROTOR DRIVE LINK INSTALLATION (cont) 11-5-13

NOTE

Either side of swashplate can have link containing three spacers; the opposite side assembly will contain no spacers. If task is used for one side only, the reassembly of parts must be the same as removed.

3. **Position center loops of harness (11) on guides of drive link (12).**

4. **Connect link (12) to fork (13).**

   a. Aline link (12) with fork (13).

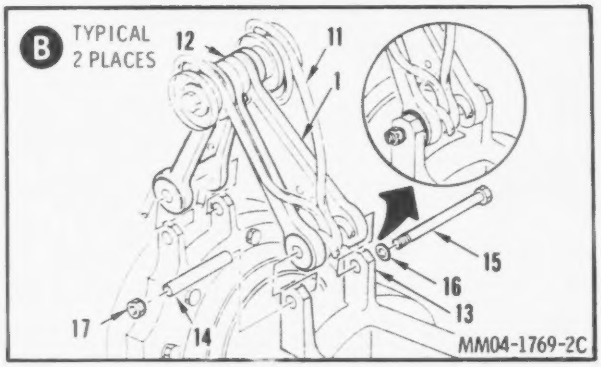
   b. Position outboard loops of harness (11) between fork ends of link (12).

   c. Install bushing (14) through fork (13), link (12), and loops in harnesses (11).

   d. Insert bolt (15) through washer (16) and bushing (14).

   e. Hold bolt (15).

   f. Install nut (17) on bolt (15).



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11-5-13. TAIL ROTOR DRIVE LINK INSTALLATION (cont) 11-5-13

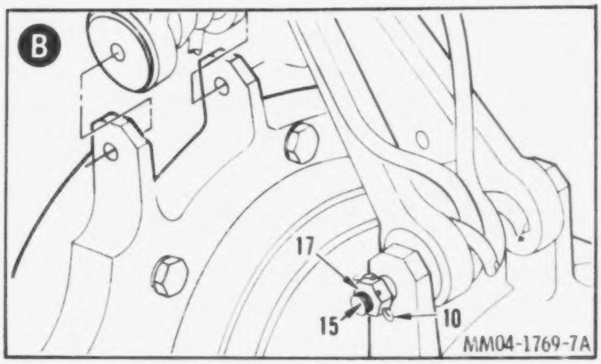
5. **Torque nut (17) 30 40 INCH-POUNDS and install cotter pin (10).**

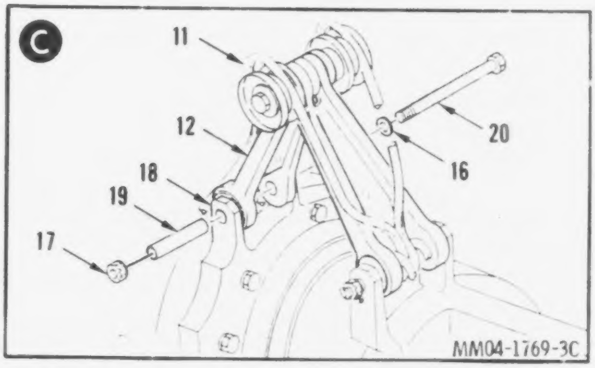
   a. Hold bolt (15).

   b. Torque nut (17) to **30 INCH-POUNDS**.

   c. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS**.

   d. Install new cotter pin (10).





6. **Connect drive link (12) to swashplate (18).**

   a. Aline link (12) with swashplate (18).

   b. Position inboard loops of de-ice wire harnesses (11) between swashplate ends of link (12).

   c. Install bushing (19) through swashplate (18), link (12), and loops in harnesses (11).

   d. Insert bolt (20) through washer (16) and bushing (19).

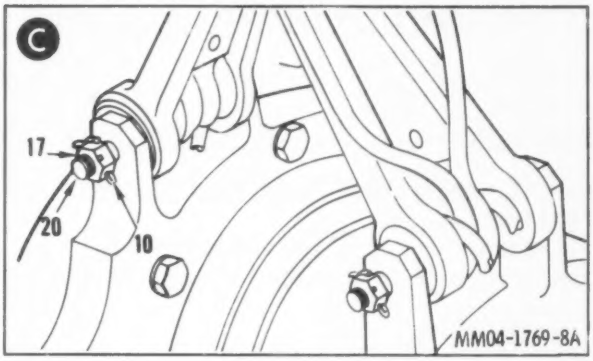
   e. Hold bolt (20).

   f. Install nut (17) on bolt (20).

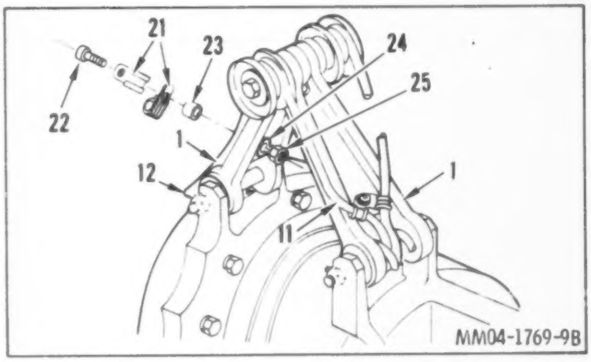
GO TO NEXT PAGE

11-5-13. TAIL ROTOR DRIVE LINK INSTALLATION (cont) 11-5-13

7. **Torque nut (17) to 30 40 INCH-POUNDS and install cotter pin (10).**
   a. Hold bolt (20).
   b. Torque nut (17) to **30 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   d. Install new cotter pin (10).



8. **Install four harness clamps (21) on drive links (1).**
   a. Position two clamps (21) on de-ice wire harnesses (12) on fork side of link (1).
   b. Insert screw (22) through mounting holes of clamps (21).
   c. Insert spacer (23) on screw (22).
   d. Insert screw (22) with spacer (23) and clamps (21) through mounting hole on link (1).



   e. Hold screw (22). Install washer (24) and nut (25).
   f. Position two clamps (21) on de-ice wire harnesses (11) on swashplate side of link (1).
   g. Insert screw (22) through mounting holes of clamps (21).
   h. Insert spacer (23) on screw (22).
   i. Insert screw (22) with spacer (23) and clamps (21) through mounting hole on link (1).
   j. Hold screw (22). Install washer (24) and nut (25).
9. **Inspect (TI).**
10. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-14. TAIL ROTOR DRIVE LINK BEARING REPLACEMENT (AVIM) 11-5-14

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Powertrain Repairer's	5180-00-003-5267
Gun, Heater	4940-00-785-1162
Press, Arbor	3444-00-223-8359

Materials/Parts:

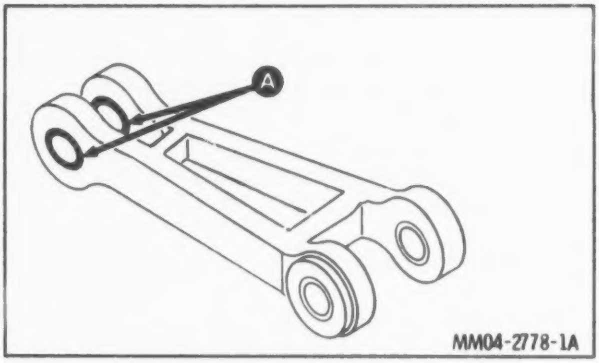
(E80) Compound, Sealant

Personnel Required:

68D10	Aircraft Powertrain Repairer
66R30	Inspector/Supervisor

NOTE

This task is typical for bearings at two locations on tail rotor drive links.



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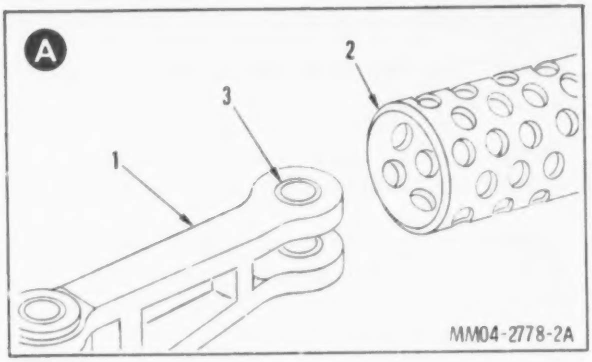
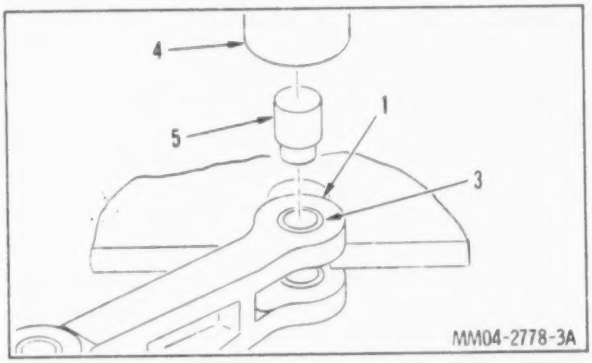
11-5-14. TAIL ROTOR DRIVE LINK BEARING REPLACEMENT (AVIM) (cont) 11-5-14

A. REMOVAL





WARNING

Temperatures used in this task can cause serious burns. Do not touch heater gun outlet or heated parts. If injury occurs, seek medical aid.

CAUTION

Do not continue heating after bearing loosens. Overheating may damage the link.

1. Heat end of drive link (1). Use heater gun (2). Stop heating when link bearing (3) loosens.
2. Place link (1) in arbor press.
3. Aline bearing (3) under press ram (4) and arbor press ram adapter (5).

NOTE

Arbor press ram adapter must be larger than bearing hole and smaller than bearing diameter.

4. Press bearing (3) from link (1). Use arbor press. Discard bearing.
5. Allow link (1) to cool.

B. CLEANING

Clean link in area of removed bearing (para 1-5-36).

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C. INSPECTION

1. Check link for scoring, nicks, or scratches.

2. Check bearing bore for elongation, scratches, cracks, or wear.

3. Damage in bore area within 1-1/2 times bore diameter is not to exceed 10% of material thickness or 0.040-inch whichever is less.

4. Check link (1) for corrosion (para 1-5-38).

D. INSTALLATION

1. Coat outside of new bearing (6). Use compound (E80).

2. Heat bearing hole in link (7). Stop heating when new bearing (6) can be started in hole. Use heater gun (2).

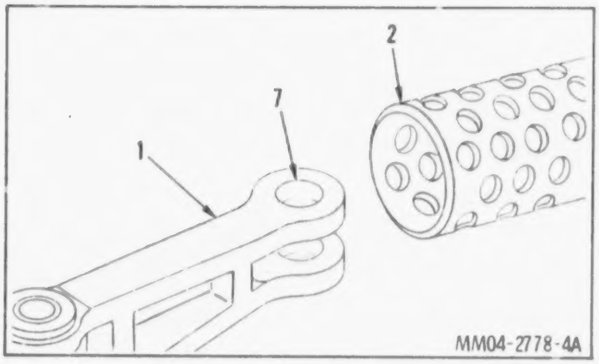
3. Place link (1) in arbor press as shown.

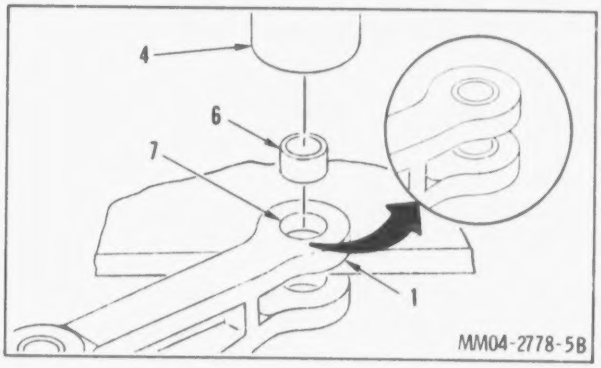
4. Aline bearing (6) and hole in link (7) under press ram (4).

5. Press bearing (6) in link (1). Apply steady pressure until bearing (6) is flush with surface of link (1). Use arbor press.

6. Allow link (1) to cool.

7. Inspect (TI).





END OF TASK

11-5-15. DIRECTIONAL FS 520 BELLCRANK REMOVAL 11-5-15

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

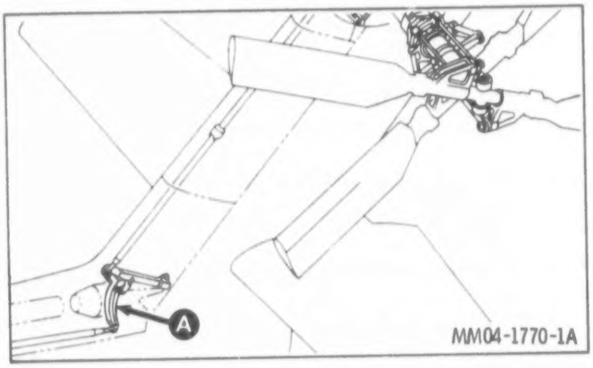
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

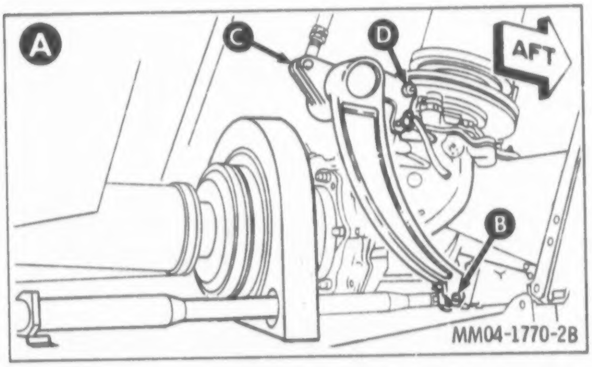
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairing L510 removed





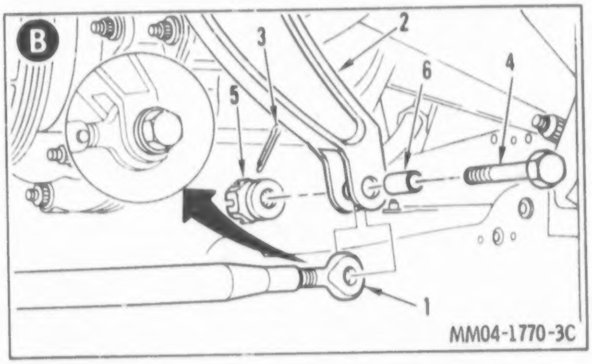
A. REMOVAL

1. **Disconnect lower push-pull rod (1) from bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4) and bushing (6).



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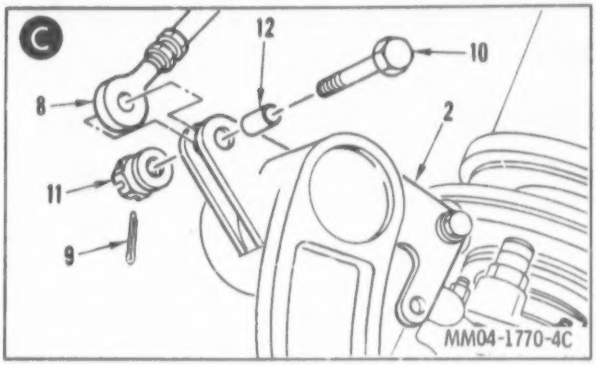
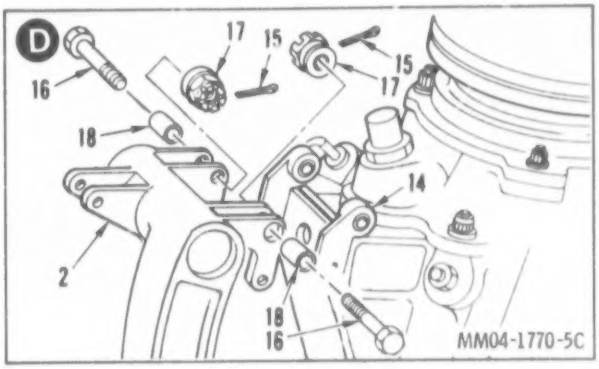
11-5-15. DIRECTIONAL FS 520 BELLCRANK REMOVAL (cont) 11-5-15

2. **Disconnect upper push-pull rod (8) from bellcrank (2).**
   a. Remove and discard cotter pin (9).
   b. Hold bolt (10). Remove nut (11).
   c. Remove bolt (10) and bushing (12).



3. **Remove bellcrank (2) from bracket (14).**
   a. Remove and discard two cotter pins (15).
   b. Hold bolts (16). Remove nuts (17).
   c. Remove bolts (16) and bushings (18).
   d. Remove bellcrank (2).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check push-pull rod, upper and lower bellcranks, and attaching parts for damage** (para 11-5-1).
2. **Check push-pull rod, upper and lower bellcranks, and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-16. DIRECTIONAL FS 520 BELLCRANK INSTALLATION 11-5-16

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (4)

Personnel Required:

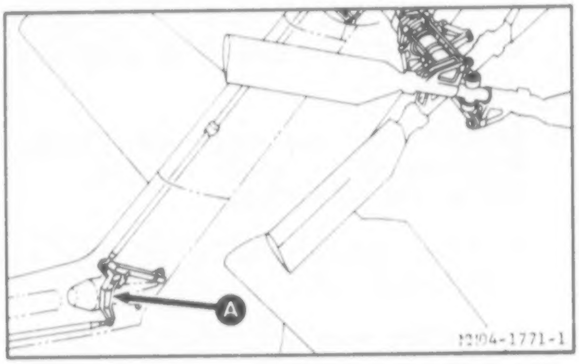
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

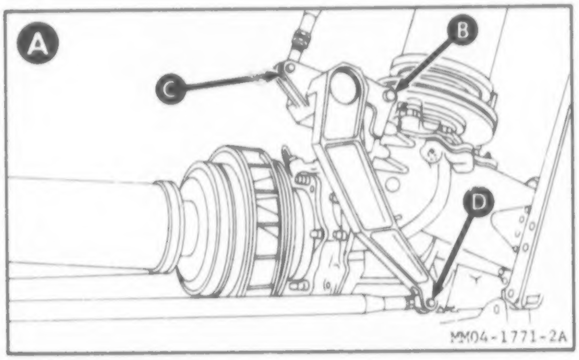
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





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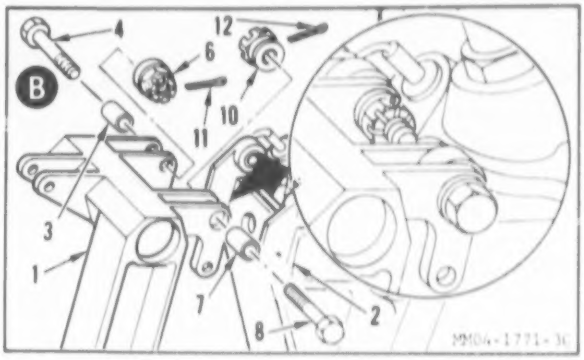
11-5-16. DIRECTIONAL FS 520 BELLCRANK INSTALLATION (cont) 11-5-16



1. Install bellcrank (1) on bracket (2).

   a. Aline bellcrank (1) with bracket (2).

   b. Install bushing (3).

   c. Insert bolt (4) through bushing (3), bellcrank (1), and bracket (2) (para 11-2-1).

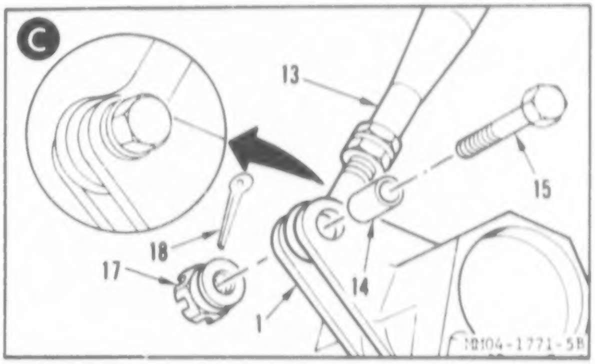
   d. Hold bolt (4). Install nut (6).

   e. Install bushing (7).

   f. Insert bolt (8) through bellcrank (1) and bracket (2) (para 11-2-1).

   g. Hold bolt (8). Install nut (10).

   h. Install new cotter pins (11) and (12).



2. Connect upper push-pull rod (13) to bellcrank (1). Torque nut (14) 100 to 140 INCH-POUNDS.

   a. Aline push-pull rod (13) with bellcrank (1).

   b. Install bushing (14).

   c. Insert bolt (15) through bellcrank (1) bushing (14), and push-pull rod (13) (para 11-2-1).

   d. Hold bolt (15). Install nut (17).

   e. Torque nut (17) to **100 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **140 INCH-POUNDS.**

   g. Install new cotter pin (18).

GO TO NEXT PAGE

11-5-16. DIRECTIONAL FS 520 BELLCRANK INSTALLATION (cont) 11-5-16

3. **Connect lower push-pull rod (19) to bellcrank (1).** Torque nut (23) **100 to 140 INCH-POUNDS.**

   a. Aline push-pull rod (19) with bellcrank (1).

   b. Install bushing (20).

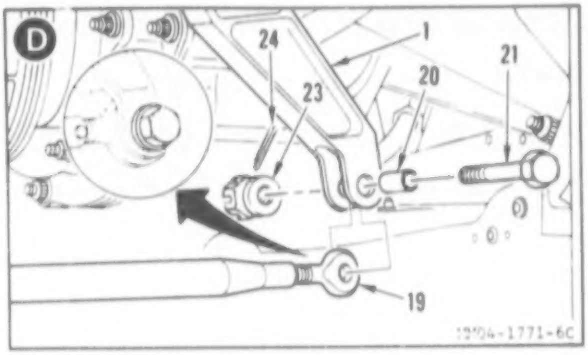
   c. Insert bolt (21) through bellcrank (1), bushing (20), and push-pull rod (19).

   d. Hold bolt (21). Install nut (23).

   e. Torque nut (23) to **100 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **140 INCH-POUNDS.**

   g. Install new cotter pin (24).



4. **Inspect (TI).**

5. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

6. **Secure access fairing L510** (para 2-2-2).

END OF TASK

11-5-17. DIRECTIONAL FS 542 BELLCRANK REMOVAL 11-5-17

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

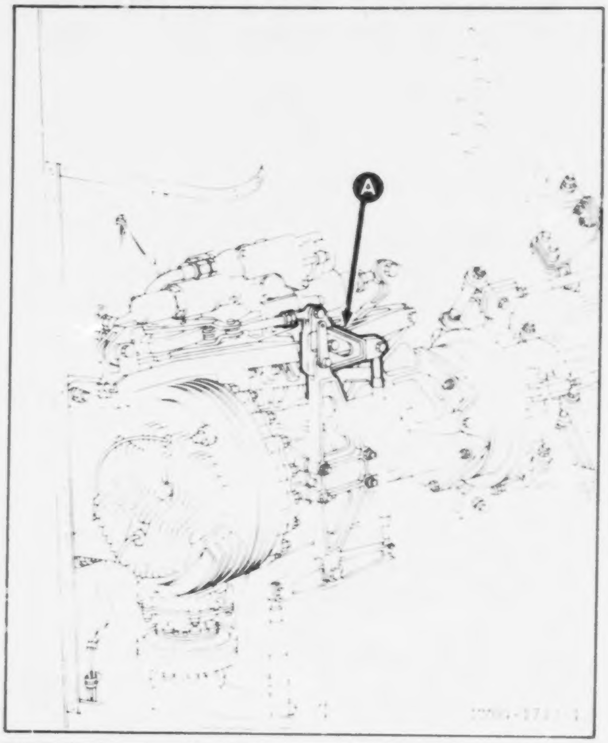
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Acccess fairings L530 and L540 removed



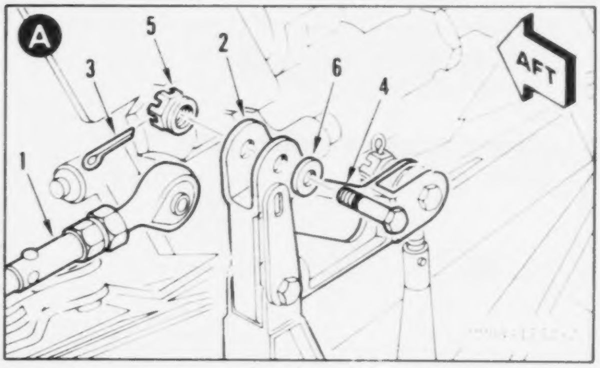
A. REMOVAL

1. **Disconnect connecting link (1) from bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4) and washer (6).

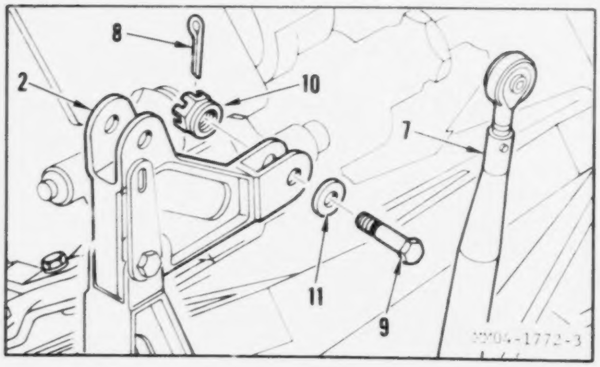


2. **Disconnect push-pull rod (7) from bellcrank (2).**

   a. Remove and discard cotter pin (8).

   b. Hold bolt (9). Remove nut (10).

   c. Remove bolt (9) and washer (11).



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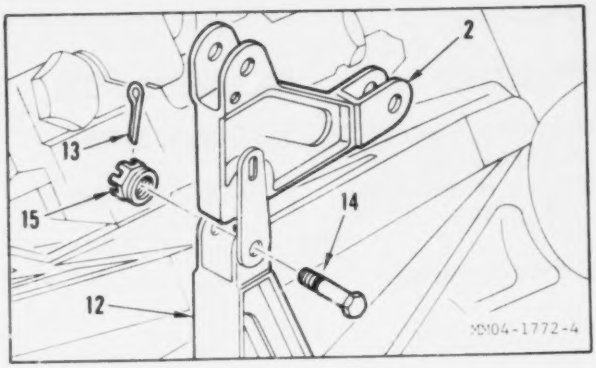
11-5-17. DIRECTIONAL FS 542 BELLCRANK REMOVAL (cont) 11-5-17

3. **Remove bellcrank (2) from bracket (12).**

   a. Remove and discard cotter pin (13).

   b. Hold bolt (14). Remove nut (15).

   c. Remove bolt (14).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check link, bellcrank, and bracket for damage** (para 11-5-1).

2. **Check link, bellcrank, and bracket for corrosion** (para 1-5-38).

END OF TASK

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11-5-18. DIRECTIONAL FS 542 BELLCRANK INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Torque, Wrench, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (3)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Install bellcrank (1) on bracket (2).** Torque nut (3) **30 to 40 INCH-POUNDS.**

   a. Aline bellcrank (1) with bracket (2).

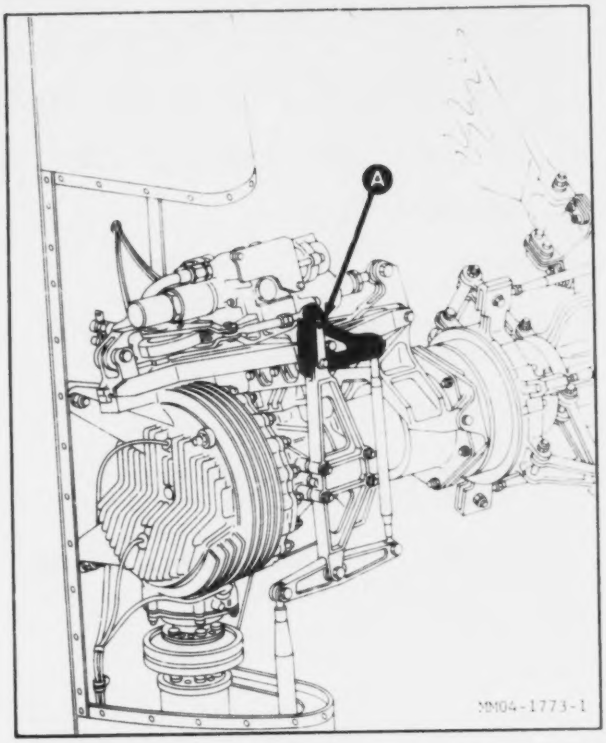
   b. Insert bolt (4) through bracket (2) and bellcrank (1) (para 11-2-1).

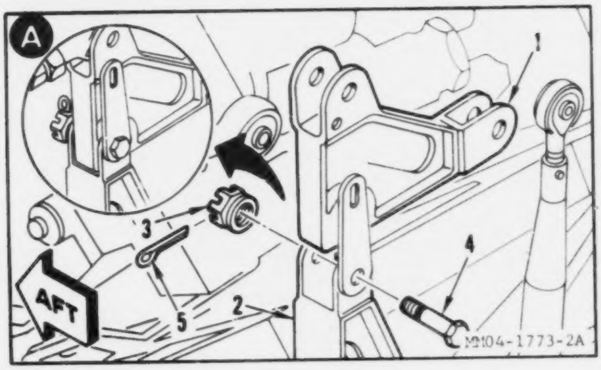
   c. Hold bolt (4). Install nut (3).

   d. Torque nut (3) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install cotter pin (5).





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11-5-18. DIRECTIONAL FS 542 BELLCRANK INSTALLATION (cont) 11-5-18

2. **Connect push-pull rod (6) to bellcrank (1).** Torque nut (7) **30 to 40 INCH-POUNDS.**

   a. Aline push-pull rod (6) with bellcrank (1).

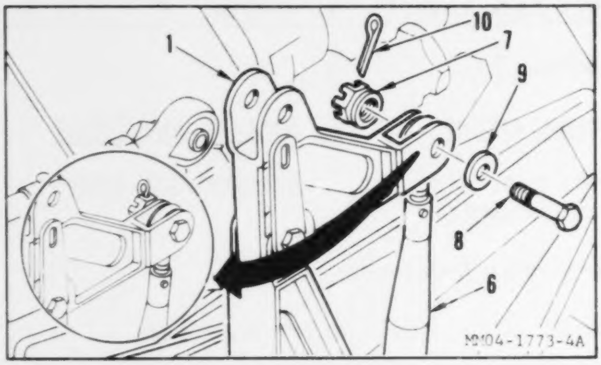
   b. Insert bolt (8) through washer (9), bellcrank (1), and push-pull rod (6).

   c. Hold bolt (8). Install nut (7).

   d. Torque nut (7) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (10).



3. **Connect connecting link (11) to bellcrank (1).** Torque nut (12) **30 to 40 INCH-POUNDS.**

   a. Aline connecting link (11) with bellcrank (1).

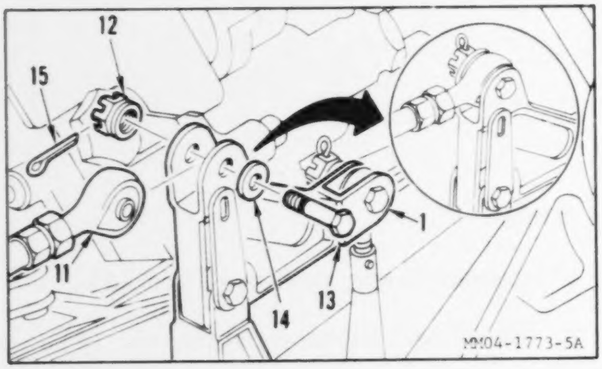
   b. Insert bolt (13) through washer (14), bellcrank (1), and connecting link (11) (para 11-2-1).

   c. Hold bolt (13). Install nut (12).

   d. Torque nut (12) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (15).



4. **Inspect (TI).**

5. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

6. **Secure access fairings L530 and L540** (para 2-2-2).

END OF TASK

11-5-19. DIRECTIONAL FS 534 BELLCRANK REMOVAL 11-5-19

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

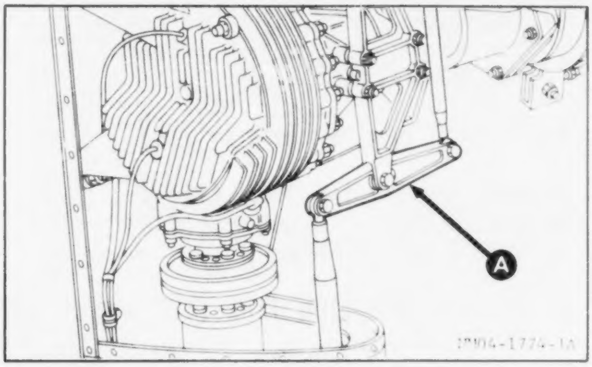
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

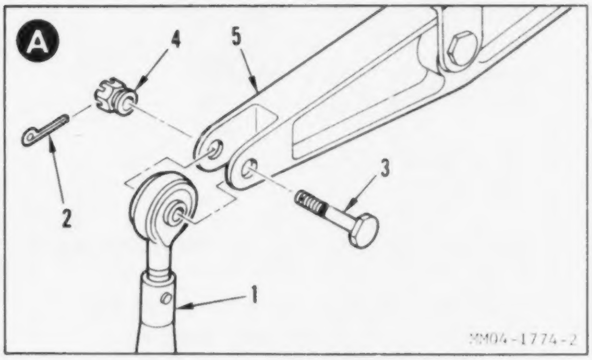
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L510, L530, and L540 removed

Personnel Required:

67R10 Attack Helicopter Repairer





A. REMOVAL

1. **Disconnect lower push-pull rod (1).**
   - a. Remove and discard cotter pin (2).
   - b. Hold bolt (3). Remove nut (4).
   - c. Remove bolt (3) from bellcrank (5) and push-pull rod (1).

GO TO NEXT PAGE

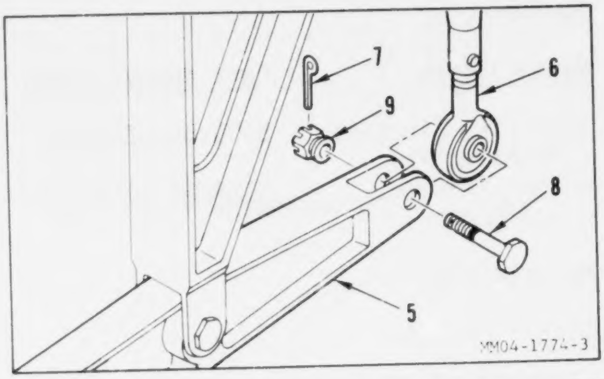
11-5-19. DIRECTIONAL FS 534 BELLCRANK REMOVAL (cont) 11-5-19

2. Disconnect upper push-pull rod (6).

a. Remove and discard cotter pin (7).

b. Hold bolt (8). Remove nut (9).

c. Remove bolt (8) from bellcrank (5) and push-pull rod (6).

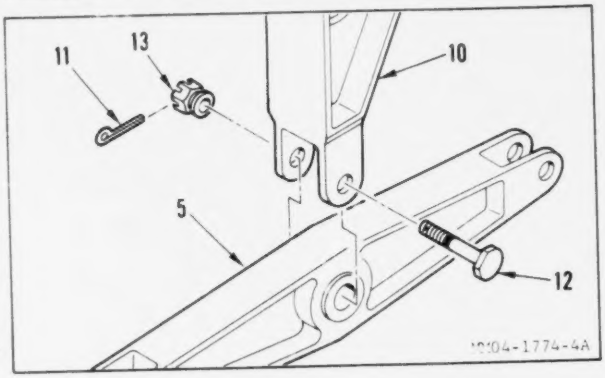


3. Remove bellcrank (5) from bracket (10).

a. Remove and discard cotter pin (11).

b. Hold bolt (12). Remove nut (13).

c. Remove bolt (12) from bellcrank (5) and bracket (10).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check bellcrank, bracket, and upper and lower push-pull rods for damage (para 11-5-1).

2. Check bellcrank, bracket, and upper and lower push-pull rods for corrosion (para 1-5-38).

END OF TASK

11-5-20. DIRECTIONAL FS 534 BELLCRANK INSTALLATION 11-5-20

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

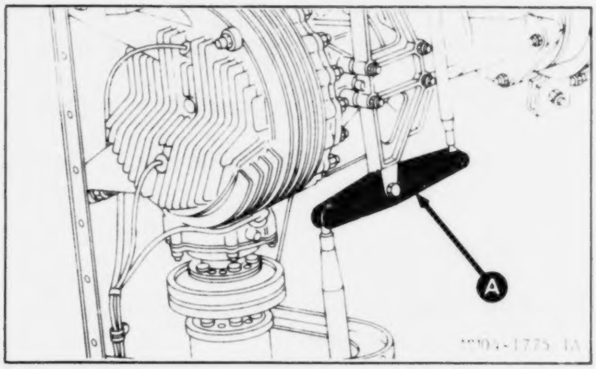
Cotter Pin (3)

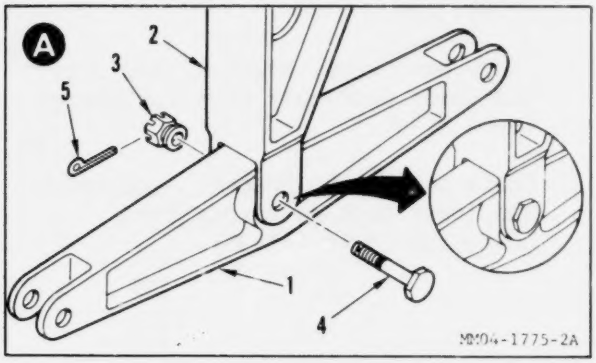
Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Install bellcrank (1) on bracket (2). Torque nut (3) 30 to 40 INCH-POUNDS.**
   a. Aline bellcrank (1) with bracket (2).
   b. Install bolt (4) through bellcrank (1) and bracket (2) (para 11-2-1).
   c. Hold bolt (4). Install nut (3).
   d. Torque nut (3) to **30 INCH-POUNDS.**
   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   f. Install cotter pin (5).

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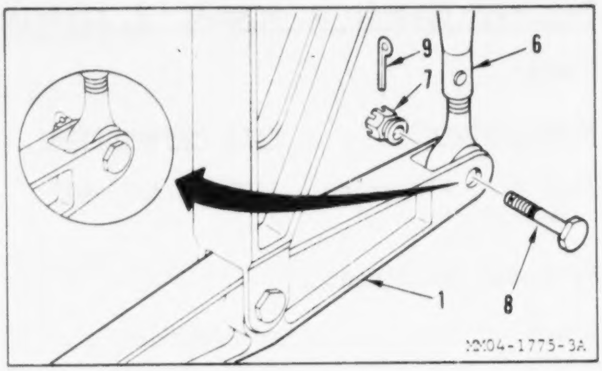
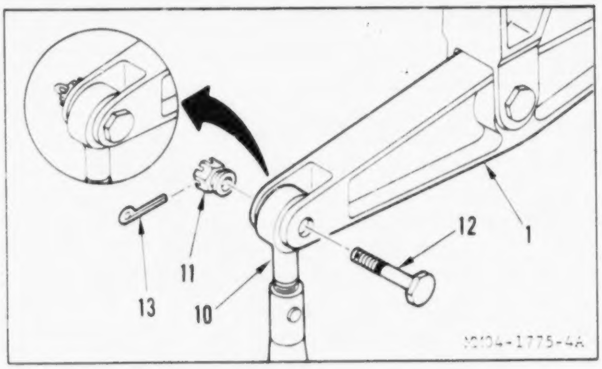
11-5-20. DIRECTIONAL FS 534 BELLCRANK INSTALLATION (cont) 11-5-20





2. **Install upper push-pull rod (6).** Torque nut (7) **30 to 40 INCH-POUNDS.**

   a. Aline push-pull rod (6) with bellcrank (1).

   b. Install bolt (8) through bellcrank (1) and push-pull rod (6) (para 11-2-1).

   c. Hold bolt (8). Install nut (7).

   d. Torque nut (7) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (9).

3. **Install lower push-pull rod (10).** Torque nut (11) **30 to 40 INCH-POUNDS.**

   a. Aline push-pull rod (10) with bellcrank (1).

   b. Install bolt (12) through bellcrank (1) and push-pull rod (10) (para 11-2-1).

   c. Hold bolt (12). Install nut (11).

   d. Torque nut (11) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (13).

4. **Inspect (TI).**

5. **Secure access fairings L510, L530 and L540** (para 2-2-2).

END OF TASK

11-5-21. TAIL ROTOR CONTROL BRACKET REMOVAL 11-5-21

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

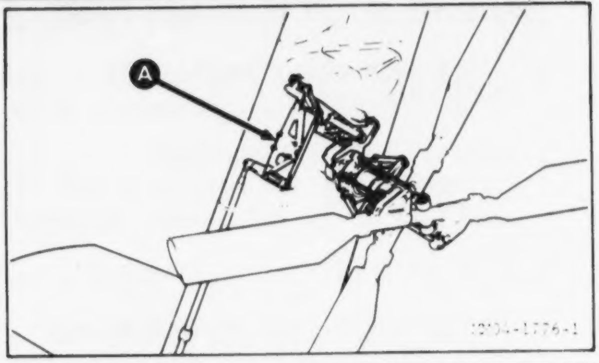
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

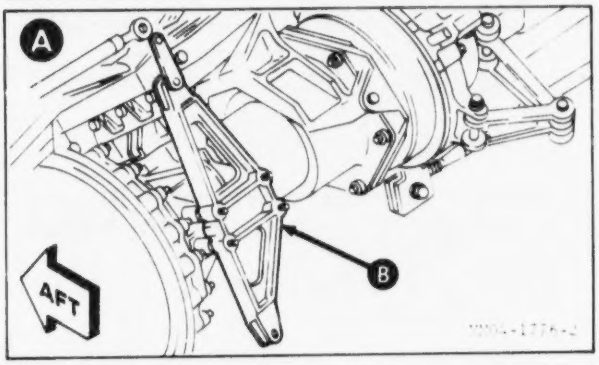
Personnel Required:

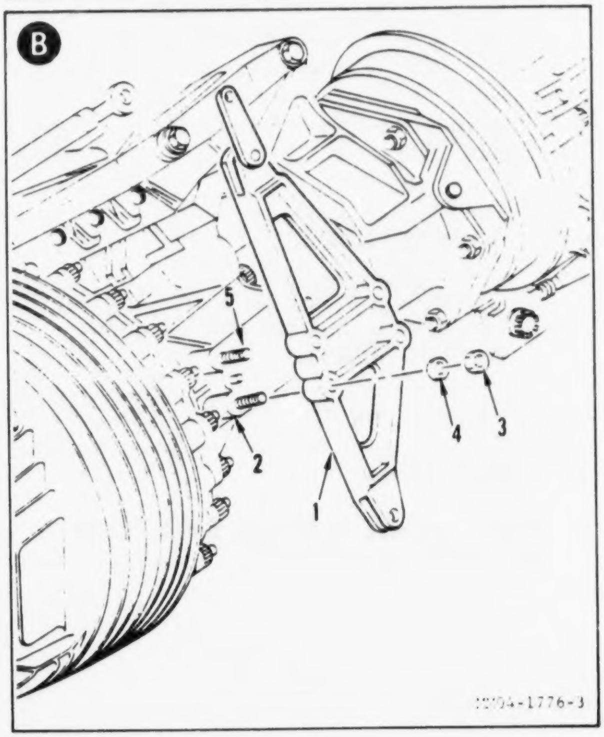
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L530, L540, and L510 removed
11-5-9	Directional control FS 534 push-pull rod removed
11-5-19	Directional control FS 542 bellcrank removed
11-5-17	Directional control FS 534 bellcrank removed







A. **REMOVAL**

1. **Remove bracket (1) from tail rotor gearbox (2).**

   a. Remove four nuts (3) and washers (4).

   b. Lift bracket (1) from studs (5).

B. **CLEANING**

Clean bracket (para 1-5-36).

C. **INSPECTION**

1. **Check bracket and attaching parts for damage** (para 11-5-1).

2. **Check bracket and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-22. TAIL ROTOR CONTROL BRACKET INSTALLATION 11-5-22

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Personnel Required:

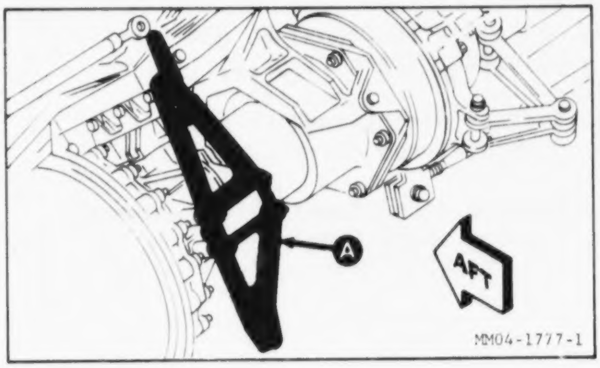
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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11-5-22. TAIL ROTOR CONTROL BRACKET INSTALLATION (cont) 11-5-22

1. **Install bracket (1) on tail rotor gearbox (2).** Torque four nuts (4) to **40 INCH-POUNDS.**

   a. Position bracket (1) on gearbox studs (3).

   b. Install four washers (5) and nuts (4). Torque four nuts (4) to **40 INCH-POUNDS.**

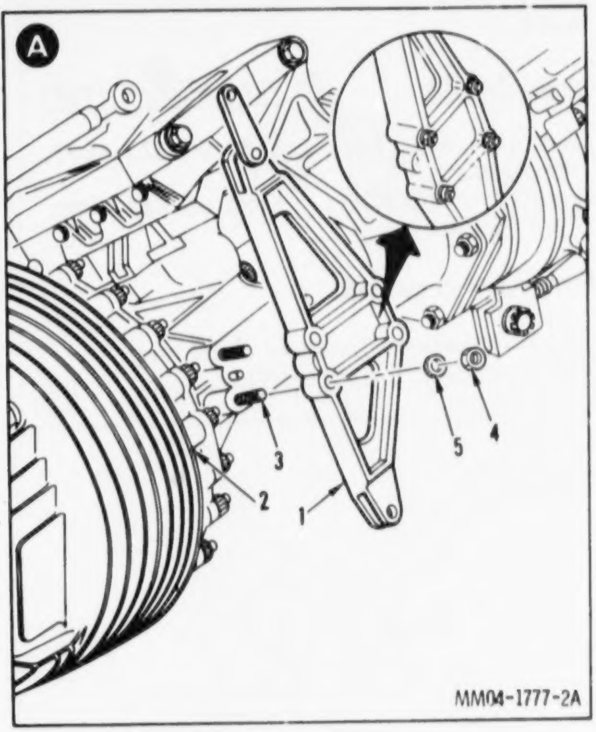
2. **Inspect** (TI).

3. **Install directional** FS 542 **bellcrank** (para 11-5-20).

4. **Install directional** FS 534 **bellcrank** (para 11-5-18).

5. **Install directional** FS 534 **push-pull rod** (para 11-5-10).

6. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).



END OF TASK

11-5-23. DIRECTIONAL SERVOCYLINDER SUPPORT REMOVAL 11-5-23

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

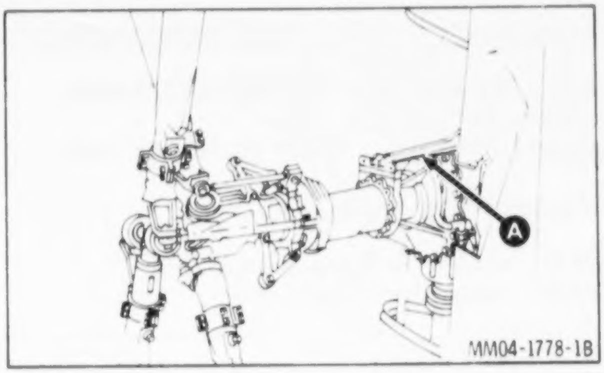
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

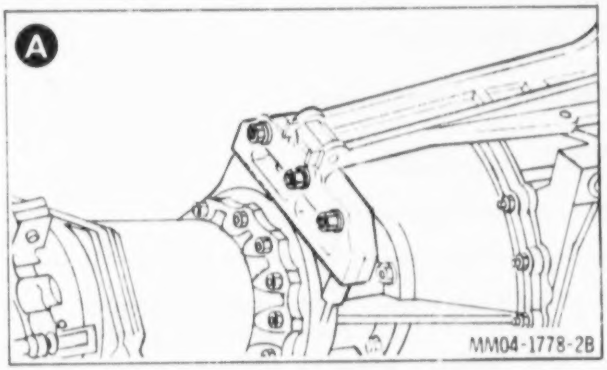
Personnel Required:

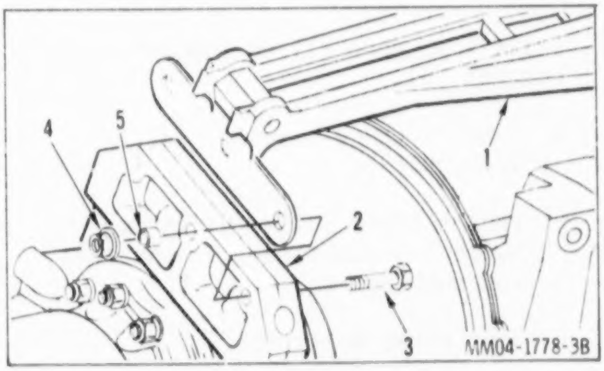
67R10 Attack Helicopter Repairer

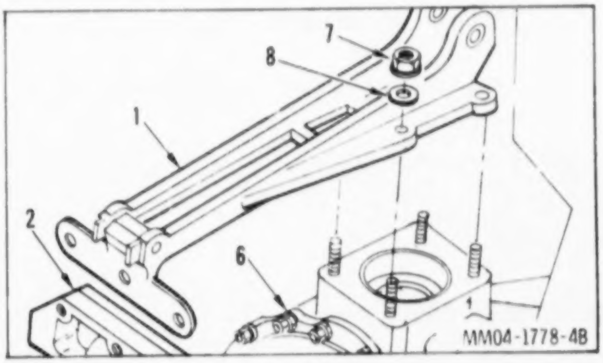
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Fairings L530 and L540 removed
7-2-39	Directional servocylinder removed
11-5-3	Tail rotor swashplate control bellcrank removed
11-5-5	Tail rotor bellcrank link removed









A. REMOVAL

1. **Disconnect directional servocylinder support (1) from support bracket (2).**
   a. Hold three bolts (3).
   b. Remove three nuts (4) and bushings (5).
   c. Remove three bolts (3).
2. **Remove support (1) from tail rotor gearbox (6).**
   a. Remove four nuts (7) and washers (8).
   b. Remove support (1) from gearbox (6).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check support and support bracket for damage** (para 11-5-1).
2. **Check support, support brackets, and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-24. DIRECTIONAL SERVOCYLINDER SUPPORT INSTALLATION 11-5-24

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque	5120-00-542-4489

Personnel Required:

67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Position directional servocylinder support (1) on four gearbox studs (2) and support bracket (3).**

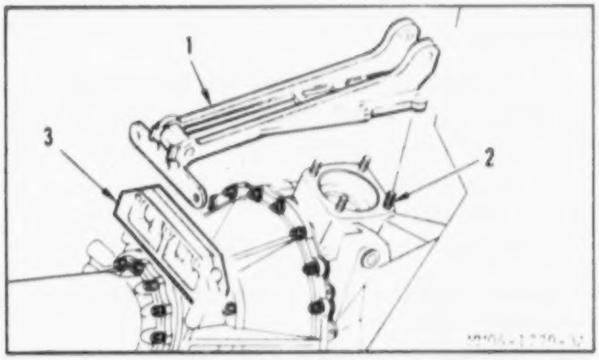
2. **Install support (1) on support bracket (3).**

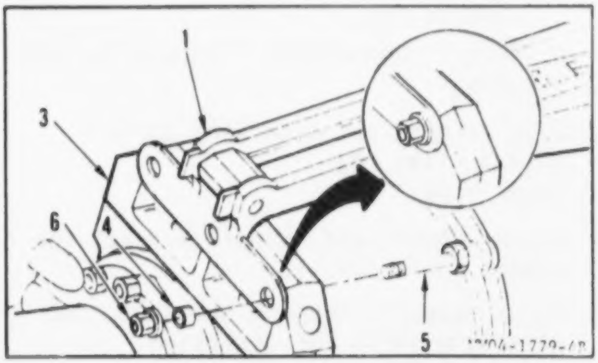
    a. Install three bushings (4) in support (3).

    b. Insert three bolts (5) through support bracket (3), support (1), and bushings (4).

    c. Hold three bolts (5).

    d. Install three nuts (6).





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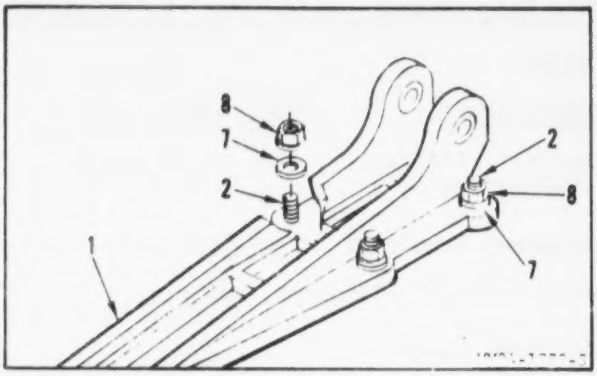
11-5-24. DIRECTIONAL SERVOCYLINDER SUPPORT INSTALLATION (cont) 11-5-24



3. **Install support (1) on gearbox studs (2).** Install four washers (7) and four nuts (8) on four gearbox studs (2). Torque nuts (8) to **120 INCH-POUNDS.**

4. **Inspect (TI).**

5. **Install tail rotor bellcrank link** (para 11-5-6).

6. **Install tail rotor swashplate control bellcrank** (para 11-5-4).

7. **Install directional servocylinder** (para 7-2-40).

8. **Install fairings L530 and L540** (para 2-2-2).

9. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-25. DIRECTIONAL SERVOCYLINDER SUPPORT BRACKET REMOVAL 11-5-25

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

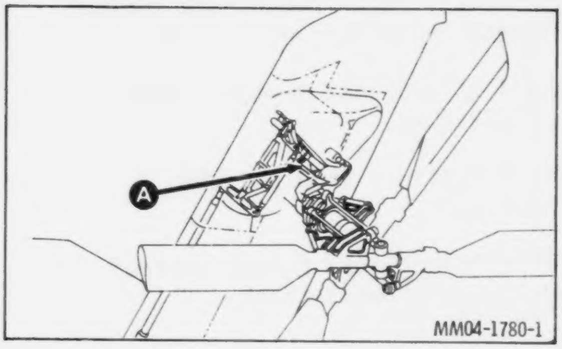
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

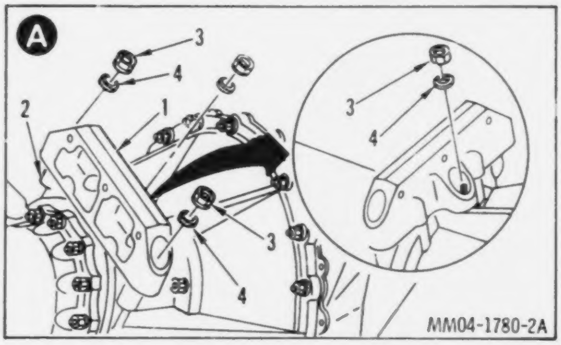
Personnel Required:

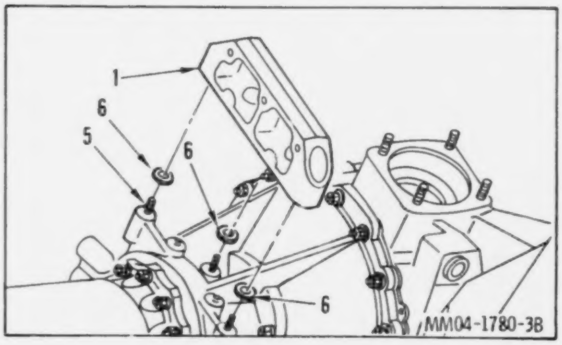
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Fairings L530 and L540 removed
7-2-3	Primary hydraulic system vented
7-4-2	Utility hydraulic system vented
7-2-39	Directional servocylinder removed
11-5-12	Tail rotor drive link removed
11-5-23	Directional servocylinder support removed







A. REMOVAL

1. **Remove directional servocylinder support bracket (1) from tail rotor gearbox (2).** Remove three nuts (3) and washers (4) from studs (5).
2. **Lift bracket (1) from studs (5).**
3. **Remove and discard three laminated spacers (6).**

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bracket and surrounding area for damage** (para 11-5-1).
2. **Check bracket and surrounding area for corrosion** (para 1-5-38).

END OF TASK

11-5-26. DIRECTIONAL SERVOCYLINDER SUPPORT BRACKET INSTALLATION 11-5-26

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

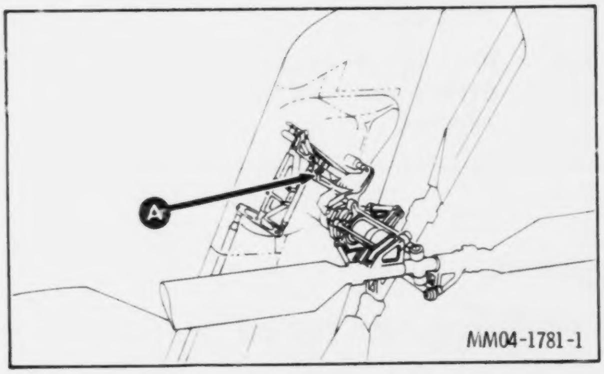
TM 55-1520-238-T

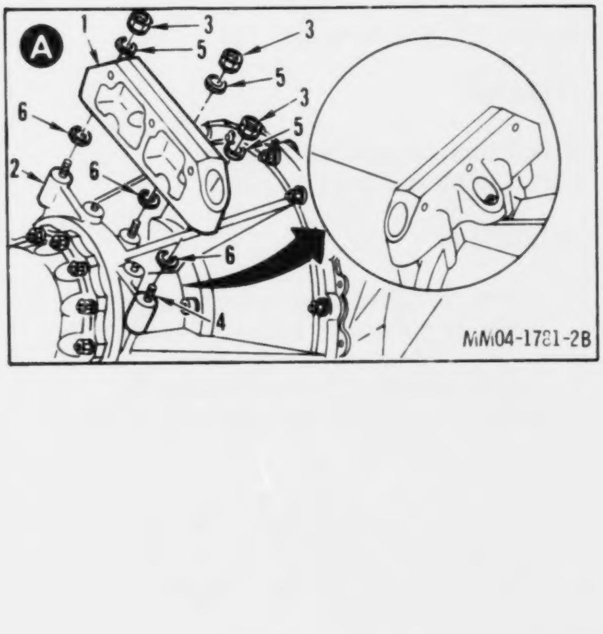
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Install directional servocylinder support bracket (1) on tail rotor gearbox (2).** Torque three nuts (3) to **50 INCH-POUNDS.**
   a. Position three laminated shim spacers on studs (4). Peel laminated spacers (6) to maintain **0.030-inch** clearance between bracket (1) and gearbox (2).
   b. Position bracket (1) on three studs (4).
   c. Install three washers (5) and nuts (3) on studs (4).
   d. Torque three nuts (3) to **50 INCH-POUNDS.**
2. **Inspect (TI).**
3. **Install servocylinder directional** support (para 11-5-24).
4. **Install tail rotor drive link** (para 11-5-13).
5. **Install directional servocylinder** (para 7-2-40).
6. **Install fairings L530 and L540** (para 2-2-2).
7. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK





11-5-27. DIRECTIONAL FS 520 BELLCRANK BRACKET REMOVAL 11-5-27

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

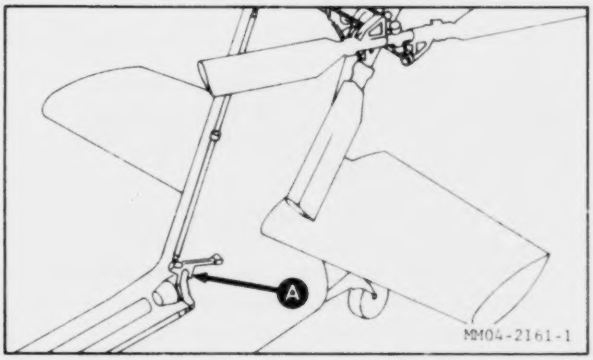
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

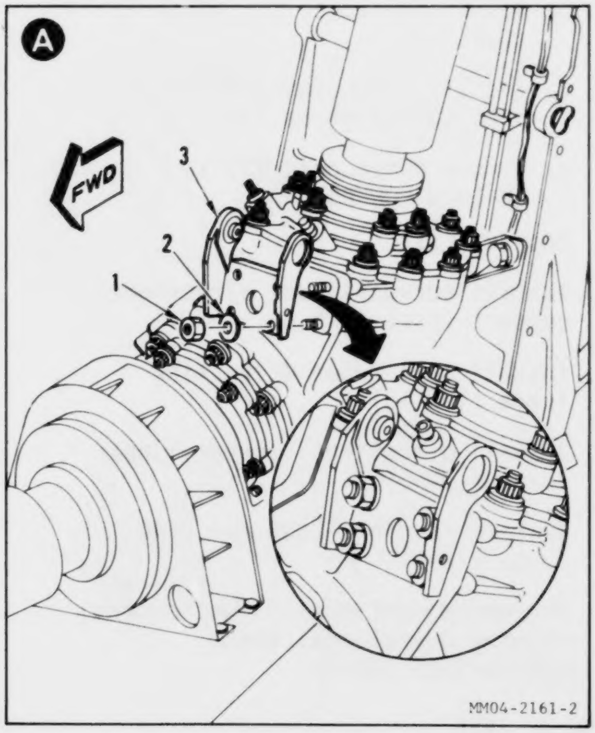
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-5-15	Directional FS 520 bellcrank removed





A. REMOVAL

1. **Remove four nuts (1) and washers (2).**
2. **Remove FS 520 bracket (3).**

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bracket and surrounding area for damage** (para 11-5-1).
2. **Check bracket and surrounding area for corrosion** (para 1-5-38).

END OF TASK

11-5-28. DIRECTIONAL FS 520 BELLCRANK BRACKET INSTALLATION 11-5-28

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Personnel Required:

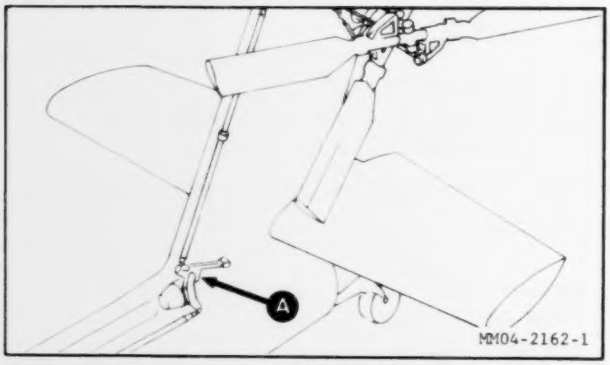
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

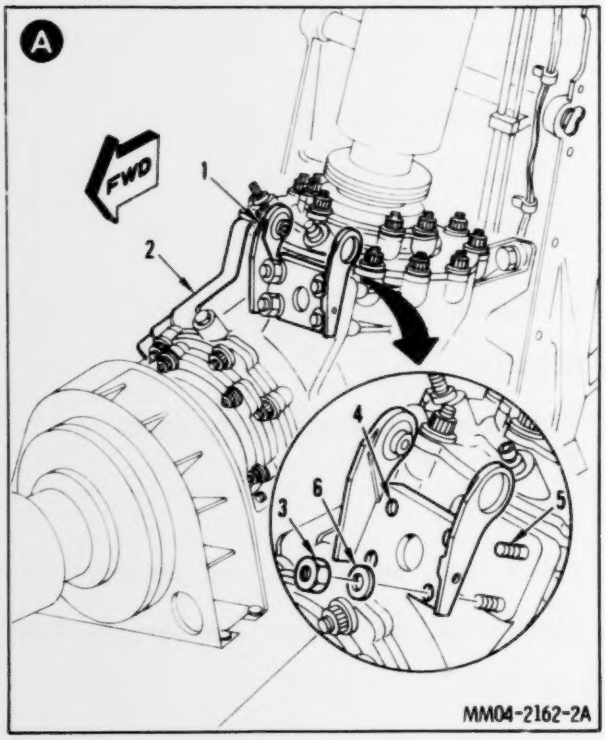
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Install FS 520 bellcrank bracket (1) on intermediate gearbox (2).** Torque nut (6) to **60 INCH-POUNDS.**
   a. Aline holes (3) with studs (4).
   b. Slide bracket (1) over studs (4).
   c. Install four washers (5) and nuts (6).
   d. Torque nuts (6) to **60 INCH-POUNDS.**
2. **Inspect (TI).**
3. **Install directional FS 520 bellcrank** (para 11-5-16).
4. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-29. TAIL ROTOR CONNECTING LINK REMOVAL 11-5-29

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

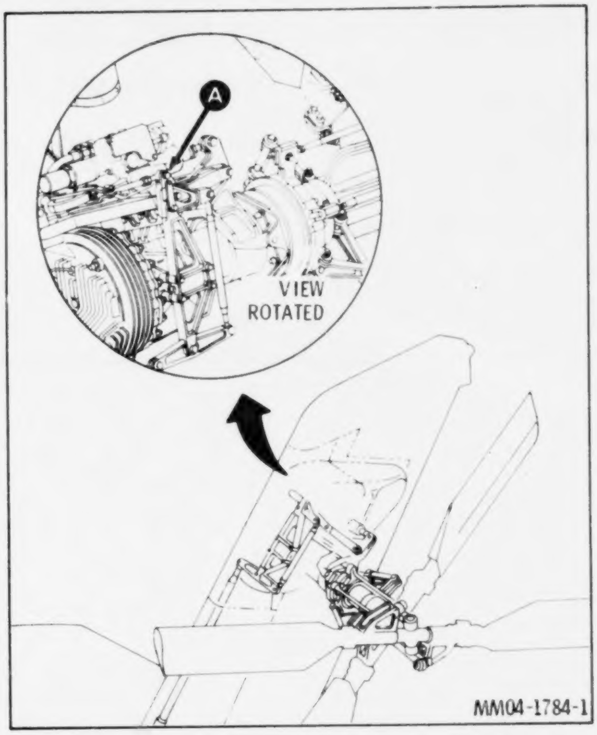
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

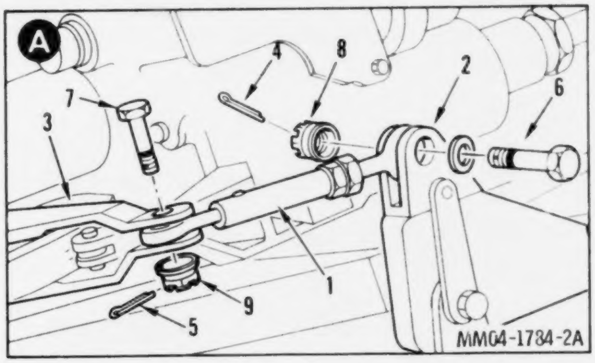
Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings L530 and L540 removed





A. REMOVAL

1. **Remove tail rotor connecting link (1) from bellcrank (2) and servocylinder (3).**
   a. Remove and discard cotter pins (4) and (5).
   b. Hold bolts (6) and (7).
   c. Remove nuts (8) and (9).
   d. Remove bolts (6) and (7) and washer (10).
   e. Remove connecting link (1).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check link, bellcrank, and servocylinder for damage** (para 11-5-1).
2. **Check link, bellcrank, and servocylinder for corrosion** (para 1-5-38).

END OF TASK

11-5-30. TAIL ROTOR CONNECTING LINK INSTALLATION 11-5-30

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (2)

Personnel Required:

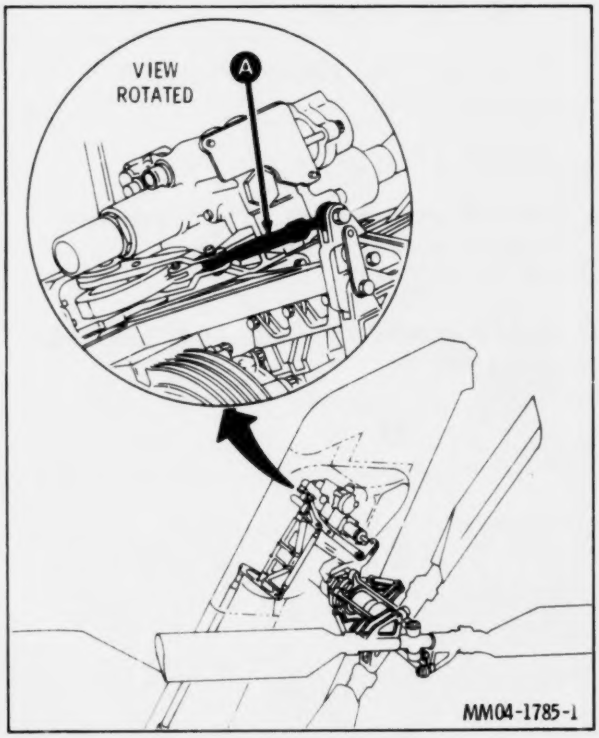
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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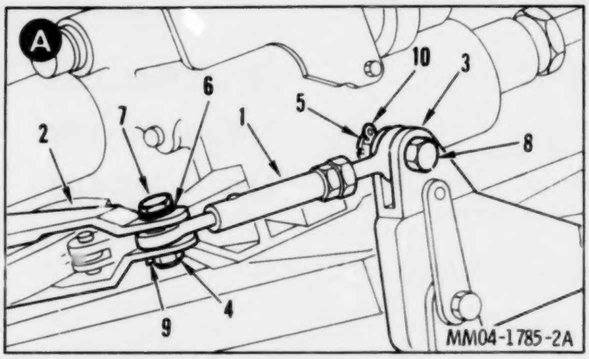
11-5-30. TAIL ROTOR CONNECTING LINK INSTALLATION (cont) 11-5-30



1. **Install tail rotor connecting link (1) on servocylinder (2) and bellcrank (3).** Torque nuts (4) and (5) **30 to 40 INCH-POUNDS.**
   a. Put link (1) in place on servocylinder (2) and bellcrank (3).
   b. Install washer (6) and bolts (7) and (8).
   c. Install nuts (4) and (5).
   d. Hold bolts (7) and (8). Torque nuts (4) and (5) to **30 INCH-POUNDS.**
   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   f. Install new cotter pins (9) and (10).
2. **Inspect (TI).**
3. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).
4. **Secure access fairings L530 and L540** (para 2-2-2).

END OF TASK

11-5-31. DIRECTIONAL FS 125 BELLCRANK AND BRACKET REMOVAL/INSTALLATION 11-5-31

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (3)

Personnel Required:

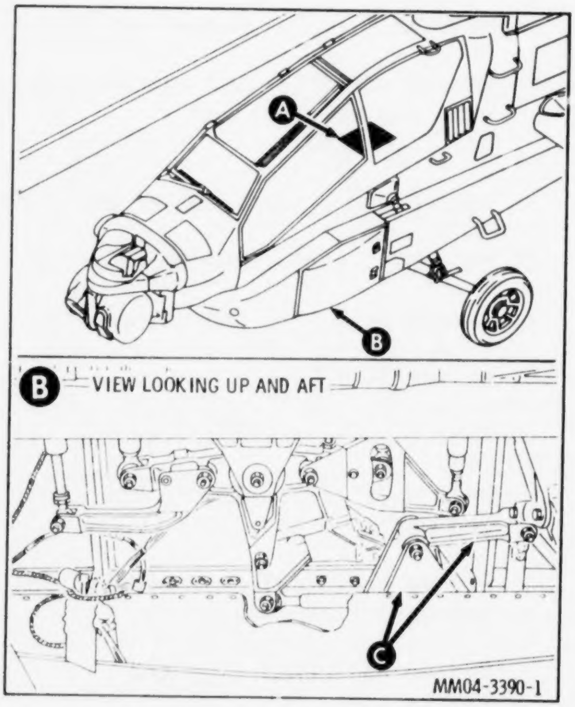
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 9-1090-208-23
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-3-12	Pilot seat removed
2-3-89	Pilot scuff plate removed
10-3-1	Forward fuel cell removed
11-3-27	Pilot cyclic cover removed
11-5-32	Directional FS 156 lower rod end removed
TM 9-1090-208-23	Area weapon and turret removed



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11-5-31. DIRECTIONAL FS 125 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-31

A. REMOVAL

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Remove pilot floor panel (1) from pilots floor (2).** Remove 28 screws (3) and washers (4).

3. **Remove bracket (5) from airframe (6).**

   a. Hold bolt (7). Remove nut (8) and washer (9), four places.

   b. Remove four bolts (7) from airframe (6).

4. **Remove bellcrank (10) from bracket (5).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (12). Remove nut (13).

   c. Remove bolt (12) and washer (14) from rod end (15) and bellcrank (10).

   d. Remove and discard cotter pin (16).

   e. Hold bolt (17). Remove nut (18).

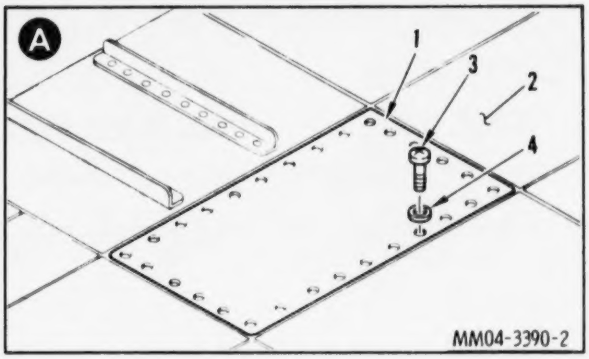
   f. Remove bolt (17) and washer (19) from rod ends (20) and (21) and bellcrank (10).

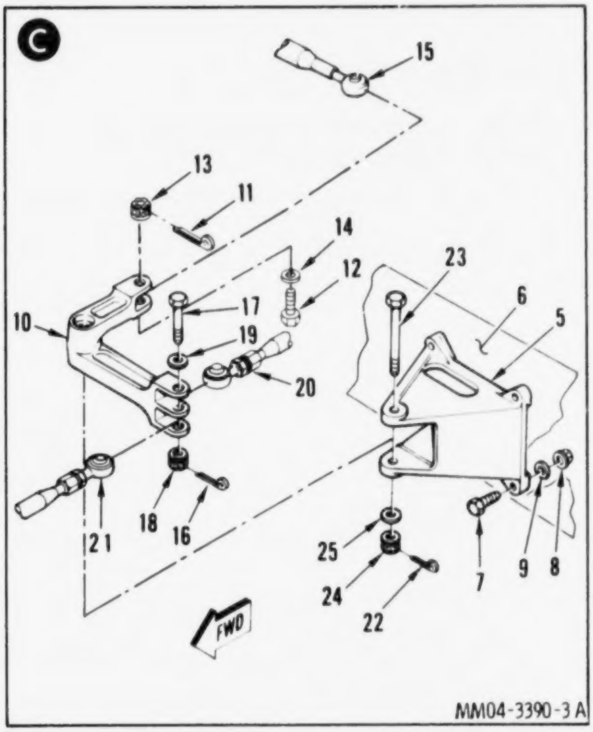
   g. Remove and discard cotter pin (22).

   h. Hold bolt (23). Remove nut (24) and washer (25).

   i. Remove bolt (23) from bracket (5) and bellcrank (10).

   j. Remove bellcrank (10) and bracket (5).





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11-5-31. DIRECTIONAL FS 125 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-31

B. CLEANING

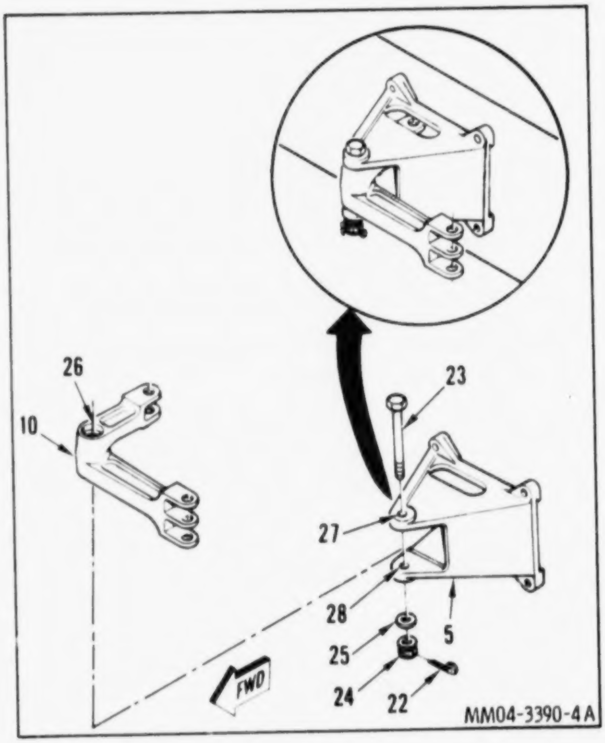
Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bellcrank and bracket for cracks.** None allowed.
2. **Check bellcrank and bracket for corrosion** (para 1-5-38).

D. INSTALLATION

1. **Install bellcrank (10) on bracket (5).** Torque nut (24) **30 to 40 INCH-POUNDS.**
   a. Aline hole (26) in bellcrank (10) with hole (27) in bracket (5).
   b. Install bolt (23) through top hole (27) of bracket (5), bellcrank (10), and bottom hole of bracket (5).
   c. Install washer (25) and nut (24) on bolt (23).
   d. Hold bolt (23). Torque nut (24) to **30 INCH-POUNDS.**
   e. Increase torque to aline cotter pin holes, but do not exceed. **40 INCH-POUNDS.**
   e. Install new cotter pin (22).



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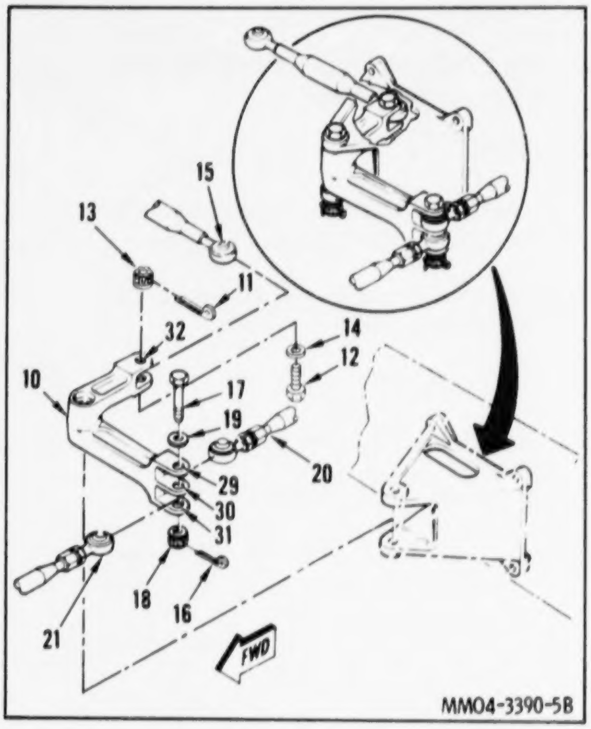
11-5-31. DIRECTIONAL FS 125 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-31



2. **Install rod ends (15), (20), and (21) on bellcrank (10).** Torque nuts (13) and (18) **30 to 40 INCH-POUNDS.**

   a. Aline rod end (20) between bellcrank lugs (29) and (30).

   b. Aline rod end (21) between bellcrank lugs (30) and (31).

   c. Install bolt (17) through washer (19) bellcrank (10), lug (29), rod end (20), lug (30), rod end (21), and lug (31).

   d. Aline rod end (15) with bellcrank lug (32).

   e. Install bolt (12) through washer (14), bellcrank lug (32) and rod end (15).

   f. Install nut (13) on bolt (12).

   g. Install nut (18) on bolt (17).

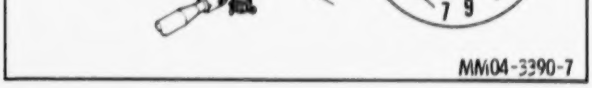
   h. Hold bolt (12). Torque nut (13) to **30 INCH-POUNDS.**

   i. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   j. Hold bolt (17). Torque nut (18) to **30 INCH-POUNDS.**

   k. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   j. Install new cotter pins (11) and (16).



3. **Install bracket (5) on airframe (6).**

   a. Aline holes on bracket (5) with holes on airframe (6).

   b. Install four bolts (7) through bracket (5) and airframe (6).

   c. Install four washers (9) and nuts (8) on bolt (7).

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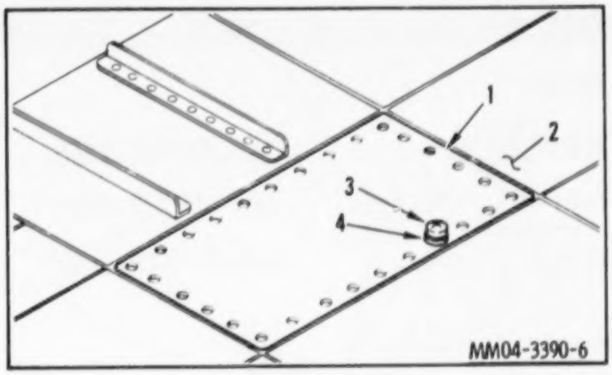
11-5-31. DIRECTIONAL FS 125 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-31



4. Inspect (TI).
5. Connect lower rod end (para 11-5-32).
6. Perform directional flight control rigging operational check (TM 55-1520-238-T).
7. Install forward fuel cell (para 10-3-2).
8. Install pilot floor panel (1) on pilot floor (2). Install 28 washers (4) and screws (3).
9. Install pilot cyclic cover (para 11-3-28).
10. Install pilot scuff plate (para 2-3-88).
11. Install pilot seat (para 2-3-12).
12. Install area weapon and turret (TM 9-1090-208-23).

END OF TASK

11-5-32. DIRECTIONAL FS 156 BELLCRANK REMOVAL/INSTALLATION 11-5-32

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter pin (3)

Personnel Required:

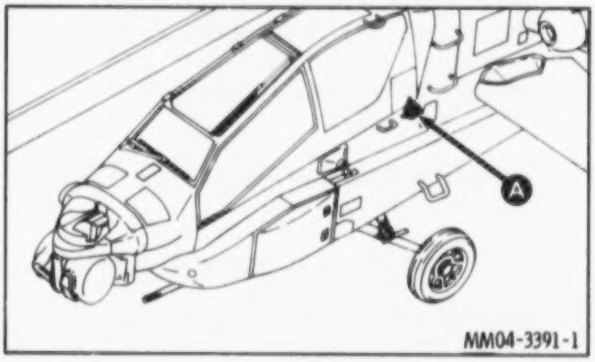
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
10-3-1	Forward fuel cell removed



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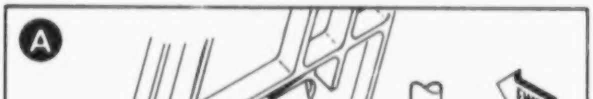

MM04-3391-2

A. REMOVAL

1. **Remove rod ends (1) and (2) from bellcrank (3).**
   a. Remove and discard cotter pin (4).
   b. Hold bolt (5). Remove nut (6).
   c. Remove bolt (5) and washer (7) from bellcrank (3) and rod end (1).
   d. Remove and discard cotter pin (8).
   e. Hold bolt (9). Remove nut (10).
   f. Remove bolt (9) and washer (11) from bellcrank (3) and rod end (2).

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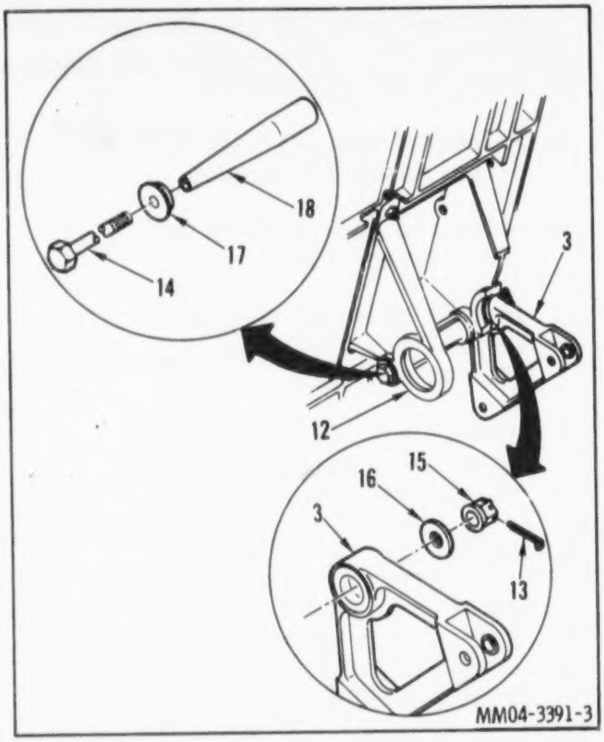
11-5-32. DIRECTIONAL FS 156 BELLCRANK REMOVAL/INSTALLATION (cont) 11-5-32



MM04-3391-3

2. **Remove bellcrank (3) from pilot collective support (12).**

   a. Remove and discard cotter pin (13).

   b. Hold bolt (14). Remove nut (15) and washer (16).

   c. Remove bolt (14), washer (17), bellcrank (3), and rotor control pivot (18).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bellcrank and control pivot for cracks.** None allowed.

2. **Check bellcrank and control pivot for corrosion** (para 1-5-38).

D. INSTALLATION

1. **Install bellcrank (3) on pilot collective support (12).** Torque nut (15) **30 to 40 INCH-POUNDS.**

   a. Install rotor control pivot (18) in pilot collective support (12).

   b. Aline hole of bellcrank (19) with collective support (12).

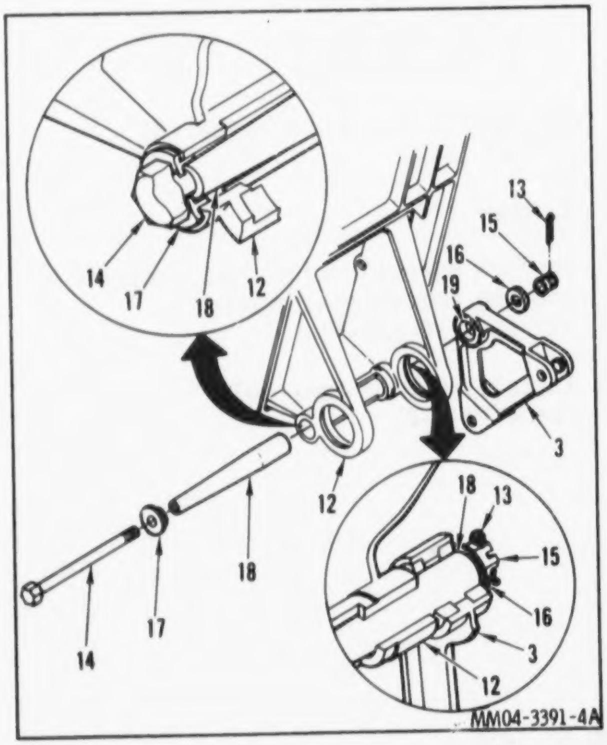
   c. Install bolt (14) through washer (17), control pivot (18), collective support (12), and bellcrank (3).

   d. Hold bolt (14). Install washer (16) and nut (15).

   e. Torque nut (15) to **30 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   g. Install new cotter pin (13).



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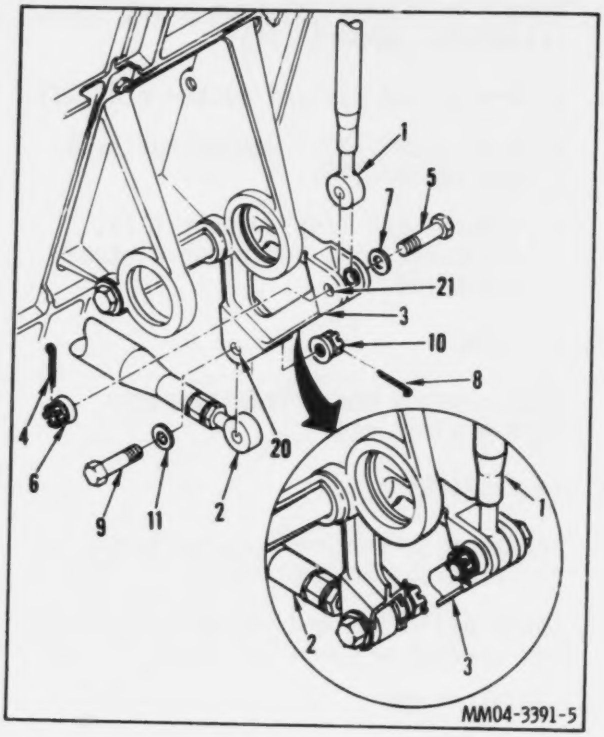
11-5-32. DIRECTIONAL FS 156 BELLCRANK REMOVAL/INSTALLATION (cont) 11-5-32



2. **Install rod ends (1) and (2) on bellcrank (3).** Torque nuts (6) and (10) **30 TO 40 INCH-POUNDS.**

   a. Aline rod end (2) with hole (20) in bellcrank (3) clevis.

   b. Aline rod end (1) with hole (21) in bellcrank (3) clevis.

   c. Install bolt (9) through washer (11), bellcrank (3), and rod end (2).

   d. Install bolt (5) through washer (7), bellcrank (3), and rod end (1).

   e. Install nut (6) on bolt (5).

   f. Install nut (10) on bolt (9).

   g. Torque nuts (6) and (10) to **30 INCH-POUNDS.**

   h. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   i. Install new cotter pins (4) and (8).

3. **Inspect (TI).**

4. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

5. **Install forward fuel cell** (para 10-3-2).

END OF TASK

11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION 11-5-33

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter pin (9)

Personnel Required:

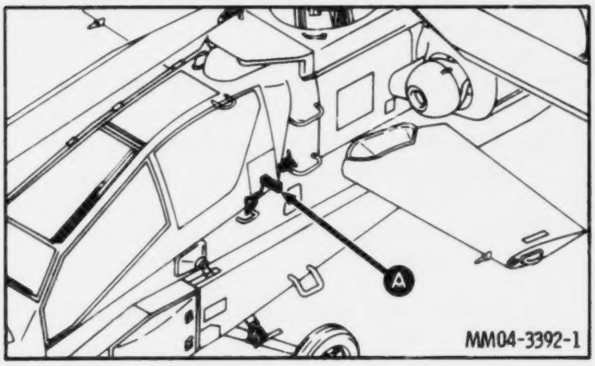
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L160 removed
10-3-1	Forward fuel cell removed



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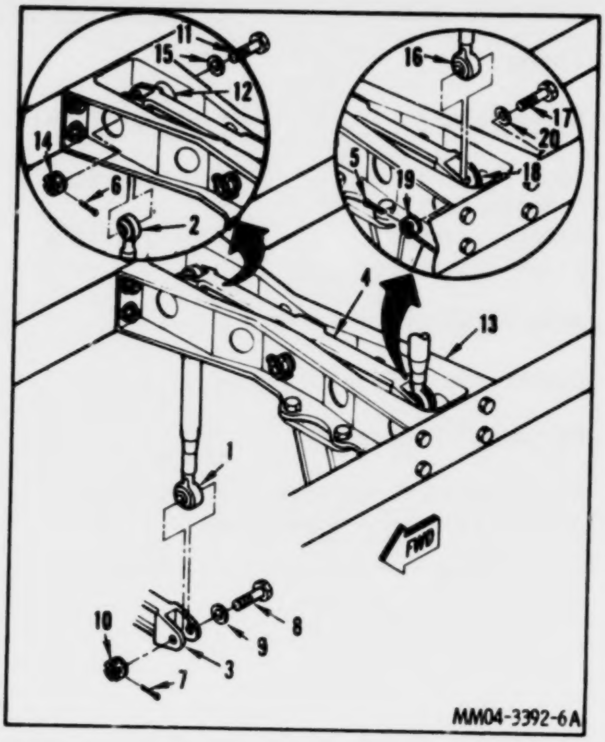
11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33

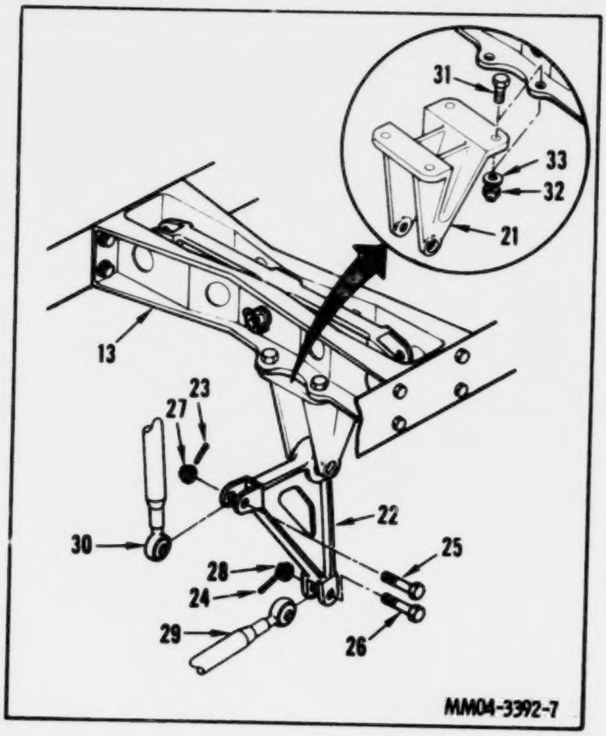
A. REMOVAL

1. **Remove rod ends (1) and (2) from bellcranks (3) and (4).**
   a. Remove and discard cotter pins (5), (6), and (7).
   b. Hold bolt (8). Remove nut (10).
   c. Remove bolt (8) and washer (9) from bellcrank (3) and rod end (1).
   d. Aline bolt (11) with hole (12) in bracket (13).
   e. Hold bolt (11). Remove nut (14).
   f. Remove bolt (11) and washer (15) from bellcrank (4) and rod end (2).



2. **Remove rod end (16) from bellcrank (4).**
   a. Aline bolt (17) with hole (18) in bracket (13).
   b. Hold bolt (17). Remove nut (19).
   c. Remove bolt (17) and washer (20) from bellcrank (4) and rod end (16).

3. **Remove bracket (21) and bellcrank (22) from bracket (13).**
   a. Remove and discard cotter pins (23) and (24).
   b. Hold bolts (25) and (26). Remove nuts (27) and (28).
   c. Remove bolts (25) and (26) from bellcrank (22) and rod ends (29) and (30).
   d. Hold four bolts (31). Remove four nuts (32) and washers (33).
   e. Remove four bolts (31) from bracket (21) and bracket (13).
   f. Remove bracket (21) and bellcrank (22) from bracket (13).



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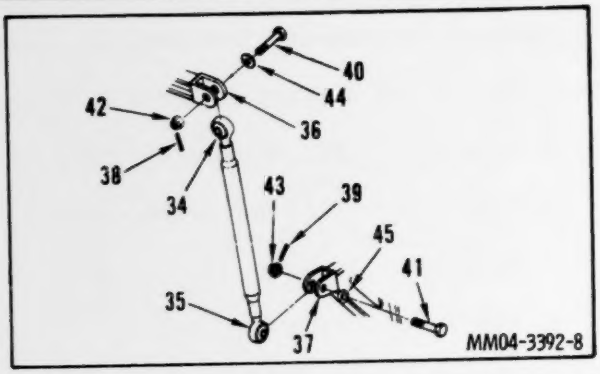
11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33

4. **Remove rod ends (34) and (35) from bellcrank (36) and (37).**

   a. Remove and discard cotter pins (38) and (39).

   b. Hold bolts (40) and (41). Remove nuts (42) and (43).

   c. Remove bolt (40), washer (44) and bolt (41) and washer (45), from rod ends (34), and (35), and from bellcrank (36) and (37).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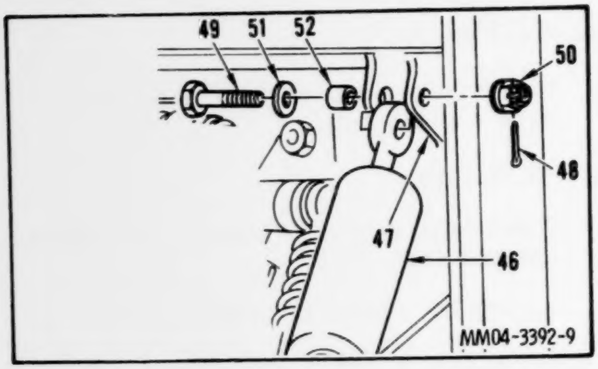
5. **Remove top of cylinder (46) from bracket (47).**

   a. Remove and discard cotter pin (48).

   b. Hold bolt (49). Remove nut (50).

   c. Remove bolt (49), washer (51), and bushing (52) from bracket (47) and cylinder (46).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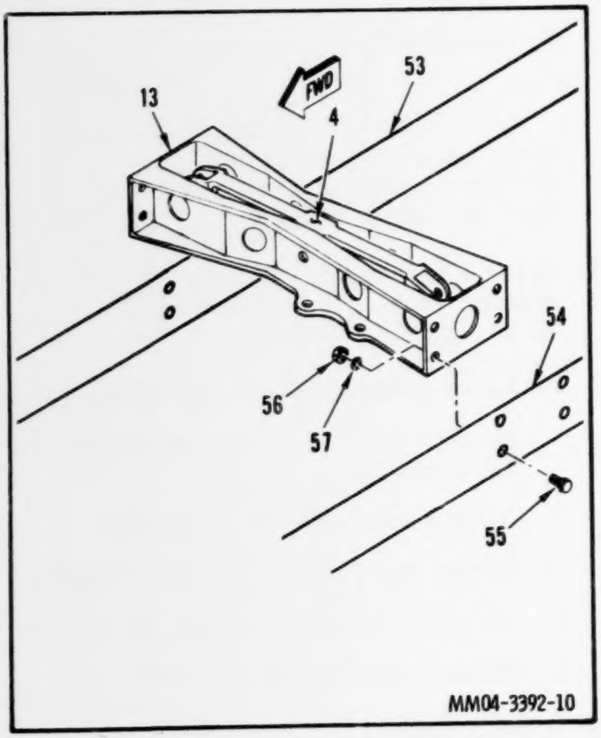
MM04-3392-9

6. **Remove bracket (13) and bellcrank (4) from airframe (53) and (54).**

   a. Hold bolt (55). Remove seven nuts (56) and washers (57).

   b. Remove seven bolts (55) from airframe (53) and (54) and bracket (13).

   c. Remove bracket (13) from airframe (53) and (54).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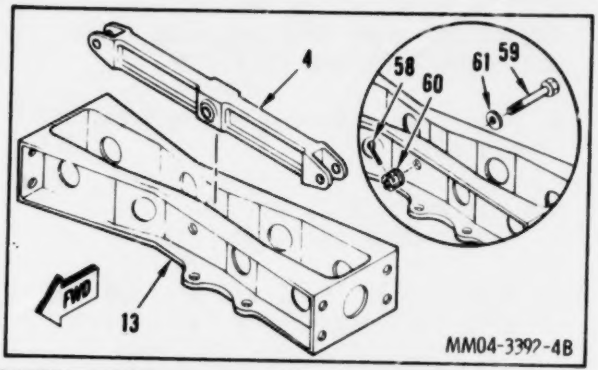
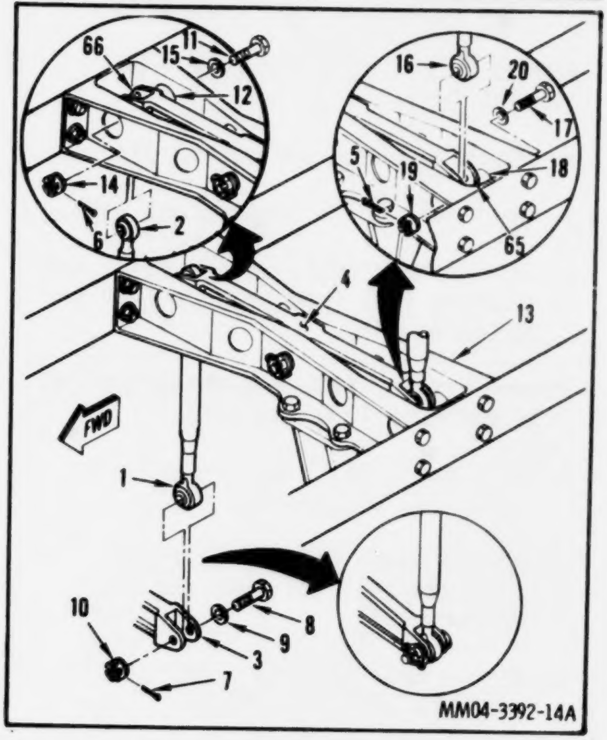
11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33





7. **Remove bellcrank (4) from bracket (13).**
   a. Remove and discard cotter pin (58).
   b. Hold bolt (59). Remove nut (60).
   c. Remove bolt (59) and washer (61) from bracket (13) and bellcrank (4).
   d. Remove bellcrank (4) from bracket (13).

B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

Check bellcranks, brackets, airframe, and rod ends for:

a. Cracks. None allowed.

b. Corrosion (para 1-5-38).

D. **INSTALLATION**

NOTE

When installing bellcrank in bracket, bushings and head of bolt must be facing aft.

1. **Install bellcrank (4) into bracket (13).** Torque nut (60) **30 to 40 INCH-POUNDS.**
   a. Aline center hole of bellcrank (4) with center hole in bracket (13).
   b. Install bolt (59) through washer (61), center hole of bracket (13), and bellcrank (4).
   c. Install nut (60) on bolt (59).
   d. Torque nut (60) to **30 INCH-POUNDS.**
   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   f. Install new cotter pin (58).

GO TO NEXT PAGE

11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33

2. Install bracket (13) and bellcrank (4) on airframe (53) and (54).

a. Aline four holes (58) of bracket (13) with holes (59) in airframe (54).

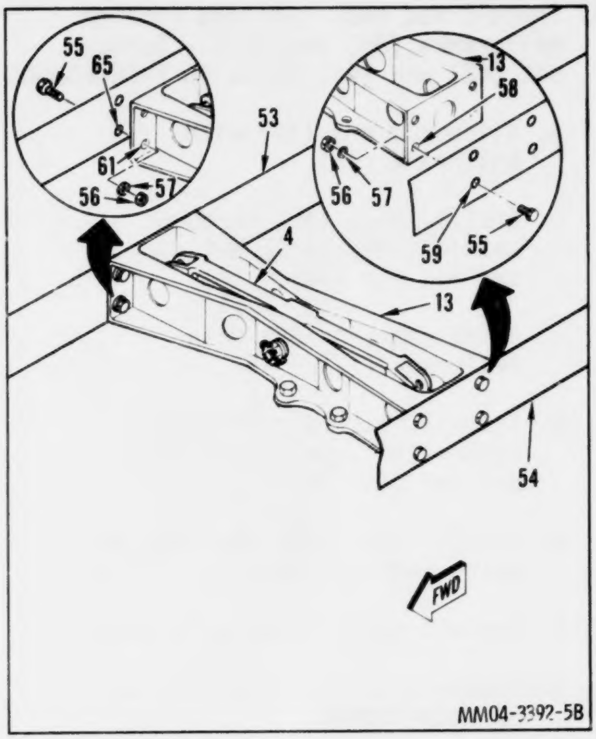
b. Install four bolts (55) through airframe (54) and bracket (13).

c. Install four washers (57) and nuts (56) on bolts (55).

d. Aline three holes (61) of bracket (13) with holes (65) in airframe (53).

e. Install three bolts (55) through airframe (53) and bracket (13).

f. Install three washers (57) and nuts (56) on bolts (55).



3. Install top of cylinder (46) on bracket (47). Torque nut (50) **30 to 40 INCH-POUNDS.**

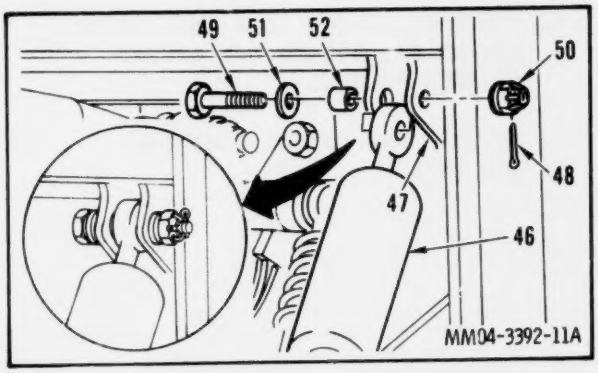
a. Install bolt (49), washer (51), and bushing (52) through bracket (47) and cylinder (46).

b. Install nut (50) on bolt (49).

c. Torque nut (50) to **30 INCH-POUNDS.**

d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

e. Install new cotter pin (48).



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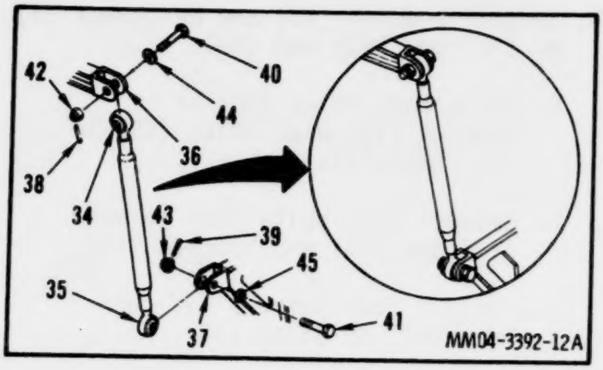
11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33



4. **Install rod ends (34) and (35) on bellcranks (36) and (37).** Torque nut (42) and (43) **30 to 40 INCH-POUNDS.**

   a. Aline rod end (34) with bellcrank (36).

   b. Install bolt (40) through washer (44), bellcrank (36) and rod end (34).

   c. Aline rod end (35) with bellcrank (37).

   d. Install bolt (41) through washer (45), bellcrank (37) and rod end (35).

   e. Install nuts (42) and (43) on bolts (40) and (41).

   f. Install nut (43) on bolt (41).

   g. Torque nuts (42) and (43) to **30 INCH-POUNDS.**

   h. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   i. Install new cotter pins (38) and (39).

GO TO NEXT PAGE

11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33

5. **Install bracket (21) and bellcrank (22) on bracket (13).** Torque nuts (27) and (28) **30 to 40 INCH-POUNDS.**

   a. Aline holes on bracket (21) with holes on bracket (13).

   b. Install four bolts (31) through bracket (13) and bracket (21).

   c. Install four washers (33) and nuts (32) on bolts (31).

   d. Aline rod ends (29) and (30) with bellcrank (22).

   e. Install bolt (25) through bellcrank (22) and rod end (30).

   f. Install bolt (26) through bellcrank (22) and rod end (29).

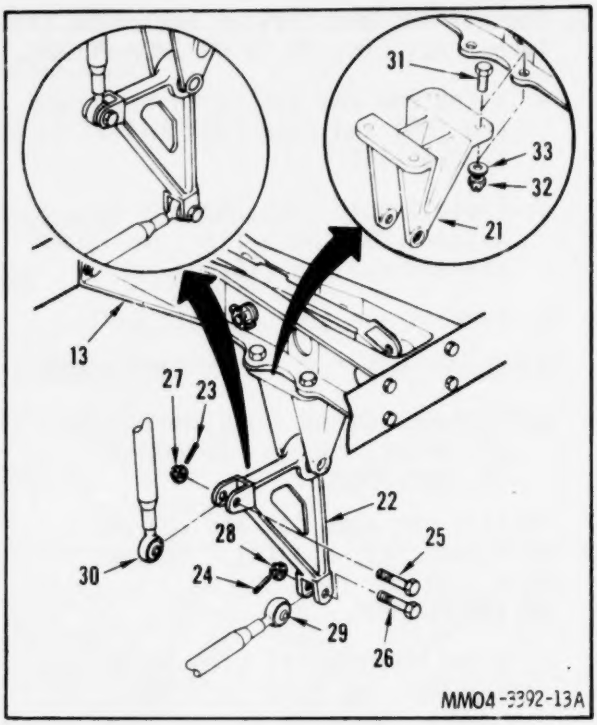
   g. Install nut (27) on bolt (25).

   h. Install nut (28) on bolt (26).

   i. Torque nuts (27) and (28) to **30 INCH-POUNDS.**

   j. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   k. Install new cotter pins (23) and (24).



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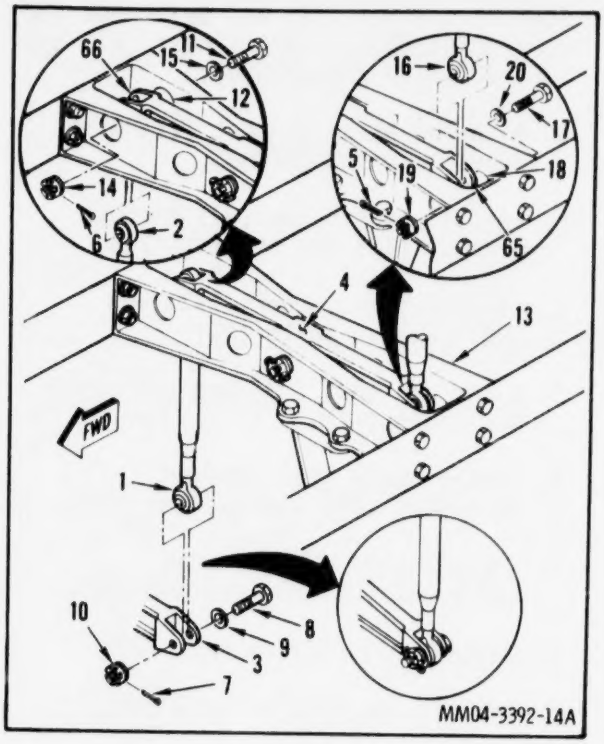
11-5-33. DIRECTIONAL FS 160 BELLCRANK AND BRACKET REMOVAL/INSTALLATION (cont) 11-5-33

6. **Install rod end (16) on bellcrank (4).** Torque nut (18) **30 to 40 INCH-POUNDS.**
   a. Aline rod end (16) with bellcrank end (65) and hole (18) in bracket (4).
   b. Install bolt (17) through washer (20), hole (18), bellcrank (4) and rod end (16).
   c. Install nut (19) on bolt (17).
   d. Torque nut (19) to **30 INCH-POUNDS.**
   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**



7. **Install rod ends (1) and (2) on bellcranks (3) and (4).** Torque nuts (10) and (14) 30 to **40 INCH-POUNDS.**
   a. Aline rod end (2) with bellcrank end (66) and hole (12) in bracket (13).
   b. Install bolt (11) through washer (15), hole (12), bellcrank ends (66) and rod end (2).
   c. Aline rod end (1) with bellcrank (3).
   d. Install bolt (8) through washer (9), bellcrank (3) and rod end (1).
   e. Install nut (10) on bolt (8).
   f. Install nut (14) on bolt (11).
   g. Torque nuts (10) and (14) to **30 INCH-POUNDS.**
   h. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   i. Install three new cotter pins (5), (6), and (7).
8. **Inspect (TI).**
9. **Perform flight control system operational check** (TM 55-1520-238-T).
10. **Install forward fuel cell** (para 10-3-2).
11. **Install access panel L160** (para 2-2-2).

END OF TASK

11-5-34. DIRECTIONAL FS 164 BRACKET REPLACEMENT 11-5-34

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

(E124) Sealant

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

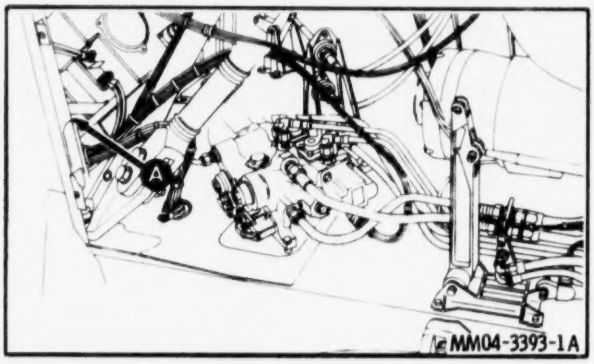
TM 55-1520-238-T

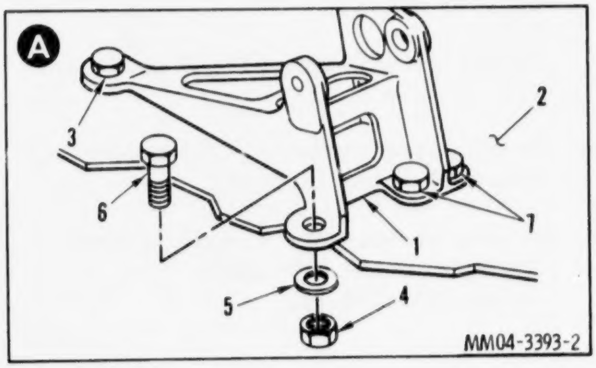
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-5-35	Directional FS 199 upper rod disconnected
11-5-64	Directional FS 164 bellcrank removed
10-3-1	Forward fuel cell removed

A. REMOVAL

1. **Remove bracket (1) from aircraft deck (2).**
   a. Hold bolt (3). Remove nut (4) and washer (5).
   b. Hold bolt (6). Remove nut (4) and washer (5).
   c. Hold two bolts (7). Remove two nuts (4) and washer (5).
   d. Remove bolts (3), (6), and (7).
   e. Remove bracket (1) from deck (2).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check bracket and deck for cracks.** None allowed.

2. **Check bracket and deck for corrosion** (para 1-5-38).

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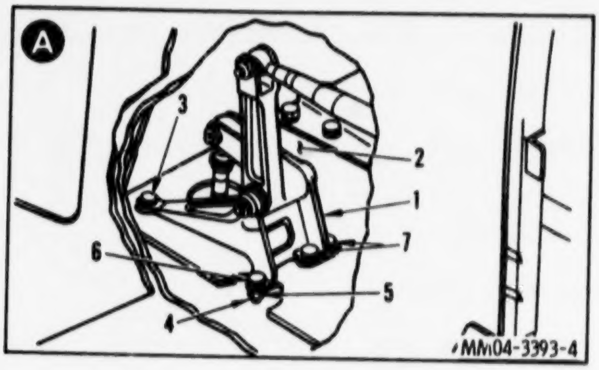
11-5-34. DIRECTIONAL FS 164 BRACKET REPLACEMENT (cont) 11-5-34

D. INSTALLATION



1. **Seal area between bracket (1) and airframe deck (2).** Use sealant (E124).
   a. Put light coat of sealant on bracket (1) mating surfaces. Use sealant (E124).
   b. Install bracket (1) on deck (2).
2. **Install bracket (1) on airframe deck (2).**
   a. Aline holes in bracket (1) with holes in deck (2).
   b. Install bolts (3), (6), through bracket (1) and deck (2).
   c. Install two bolts (7) through bracket (1) and deck (2).
   d. Hold bolt (3), (6), and two bolts (7).
   e. Install three washers (5) and nuts (4) on bolt (3), (6), and two bolts (7).
3. **Inspect (TI).**
4. **Install forward fuel cell** (para 10-3-2).
5. **Install directional FS 164 bellcrank** (para 11-5-64).
6. **Install directional FS 199 upper rod connected** (para 11-5-36).
7. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-35. DIRECTIONAL FS 199 BELLCRANK REMOVAL 11-5-35

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

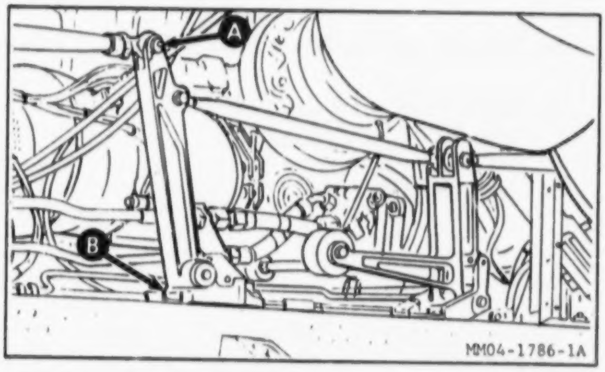
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed

Personnel Required:

67R10 Attack Helicopter Repairer



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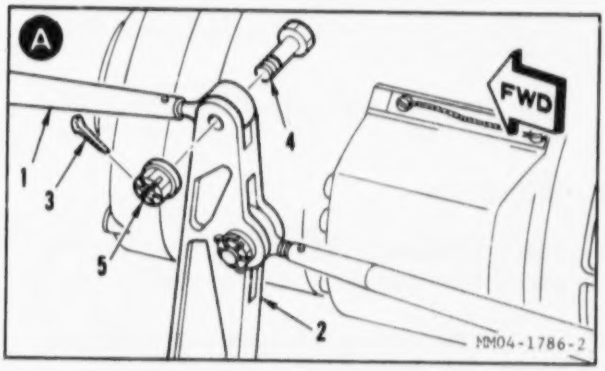

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A. REMOVAL

1. **Disconnect forward push-pull rod (1) from directional control bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4).

GO TO NEXT PAGE

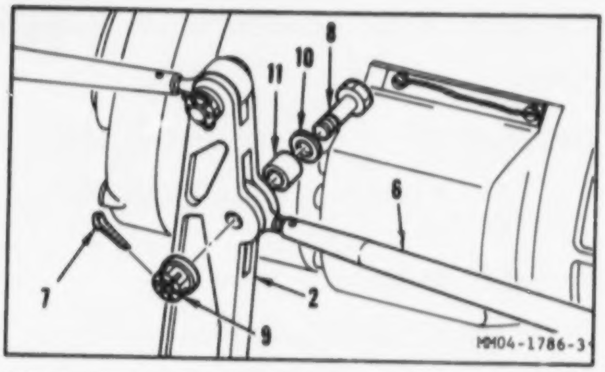
11-5-35. DIRECTIONAL FS 199 BELLCRANK REMOVAL (cont)

2. **Disconnect aft push-pull rod (6) from bellcrank (2).**

   a. Remove and discard cotter pin (7).

   b. Hold bolt (8). Remove nut (9).

   c. Remove bolt (8), washer (10), and bushing (11) from push-pull rod (6) and bellcrank (2).

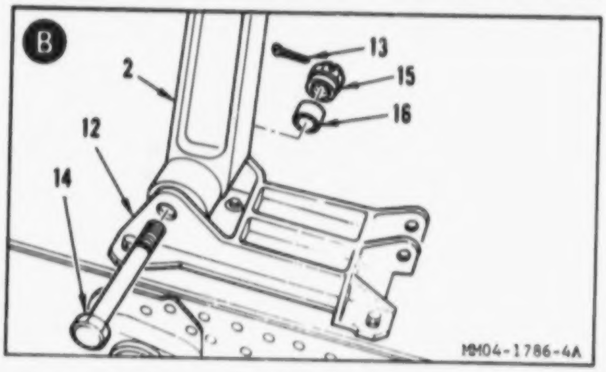


3. **Remove bellcrank (2) from bracket (12).**

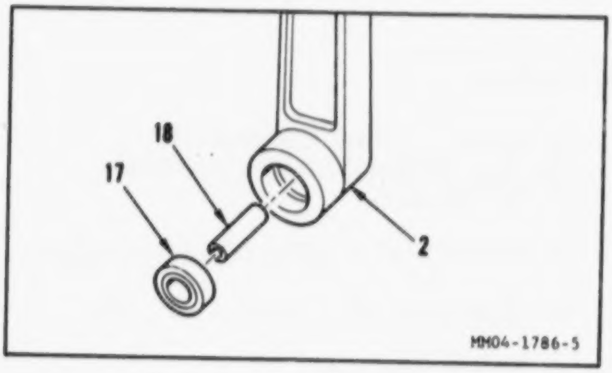
   a. Remove and discard cotter pin (13).

   b. Hold bolt (14). Remove nut (15) and bushing (16).

   c. Remove bolt (14).



4. **Remove slip-fit bearing (17) and spacer (18) from bellcrank (2).**



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed, attaching, and mating parts for damage** (para 11-5-1).

2. **Check removed, attaching, and mating parts for corrosion** (para 1-5-38).

END OF TASK

11-5-36. DIRECTIONAL FS 199 BELLCRANK INSTALLATION 11-5-36

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (3)

Personnel Required:

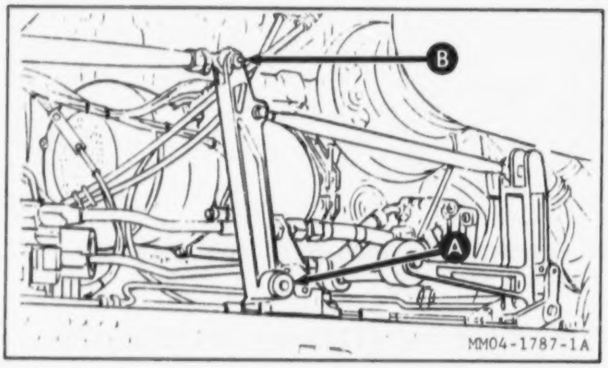
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

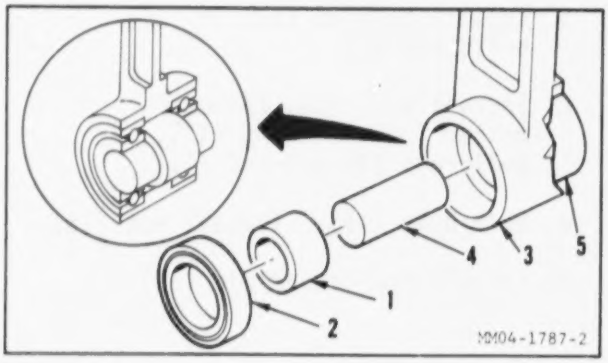
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Install spacer (1) and slip-fit bearing (2) in directional control bellcrank (3).**

   a. Insert dowel (4) into hub of bellcrank (3) through staked bearing (5).

   b. Slide spacer (1) over dowel (4) and into bellcrank (3).

   c. Aline bearing (2) with dowel (4).

   d. Install bearing (2) in bellcrank (3).

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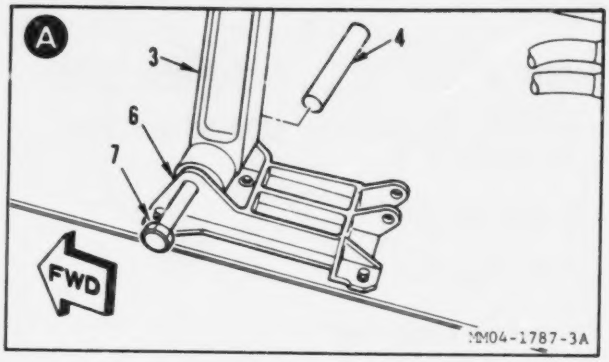
11-5-36. DIRECTIONAL FS 199 BELLCRANK INSTALLATION (cont) 11-5-36

2. **Install bellcrank (3) on bracket (6).**

   a. Aline bellcrank (3) with bracket (6).

   b. Insert bolt (7) through bracket (6) and bellcrank (3). Push dowel (4) out of bellcrank (3).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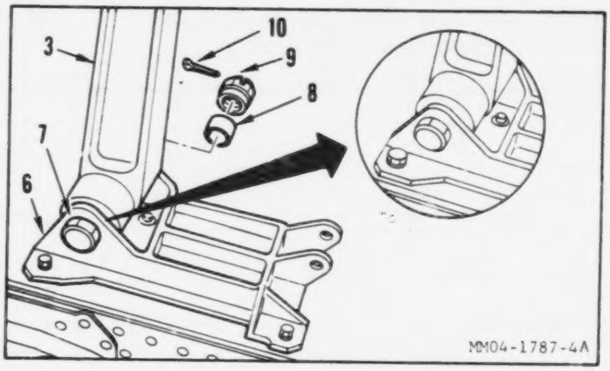
   c. Install bushing (8) in bracket (6).

   d. Hold bolt (7). Install nut (9).

   e. Install new cotter pin (10).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3. **Connect aft push-pull rod (11) to bellcrank (3).**

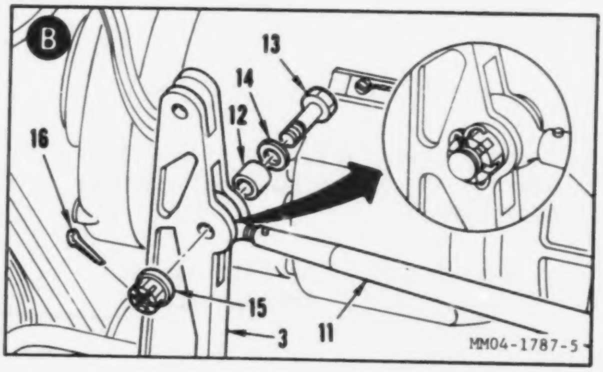
   a. Aline rod (11) with bellcrank (3).

   b. Install bushing (12) in bellcrank (3).

   c. Install bolt (13) through washer (14), bushing (12), bellcrank (3) and rod (11).

   d. Hold bolt (13). Install nut (15).

   e. Install new cotter pin (16).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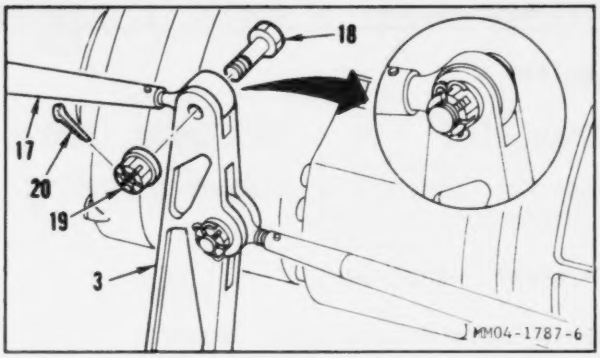
11-5-36. DIRECTIONAL FS 199 BELLCRANK INSTALLATION (cont) 11-5-36



4. **Connect forward push-pull rod (17) to bellcrank (3).**
   - a. Aline rod (17) with bellcrank (3).
   - b. Install bolt (18) through bellcrank (3) and rod (17).
   - c. Hold bolt (18). Install nut (19).
   - d. Install new cotter pin (20).
5. **Inspect (TI).**
6. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).
7. **Secure access panel L200** (para 2-2-2).

END OF TASK

11-5-37. DIRECTIONAL FS 215 BELLCRANK REMOVAL 11-5-37

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

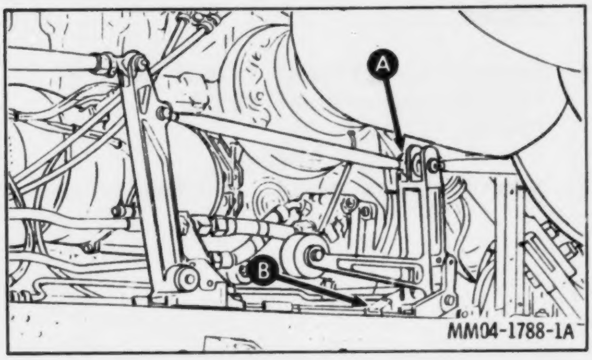
67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed

A. REMOVAL

1. **Disconnect forward push-pull rod (1) from directional control bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4), washer (6), and bushing (7).
2. **Disconnect aft push-pull rod (8) from bellcrank (2).**
   a. Remove and discard cotter pin (9).
   b. Hold bolt (10). Remove nut (11).
   c. Remove bolt (10), washer (12), and bushing (13).



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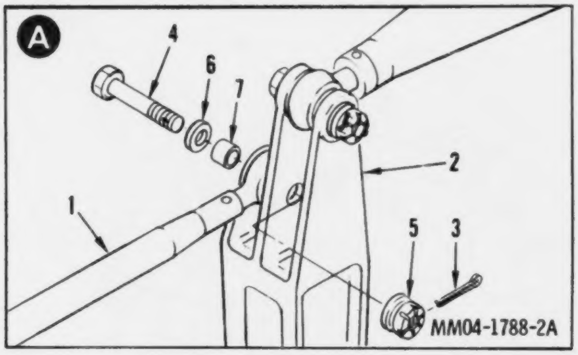

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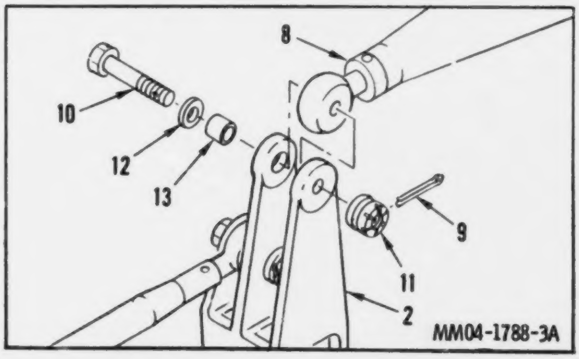

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11-5-37. DIRECTIONAL FS 215 BELLCRANK REMOVAL (cont) 11-5-37

3. **Remove bellcrank (2) from bracket (14).**

   a. Remove and discard cotter pin (15).

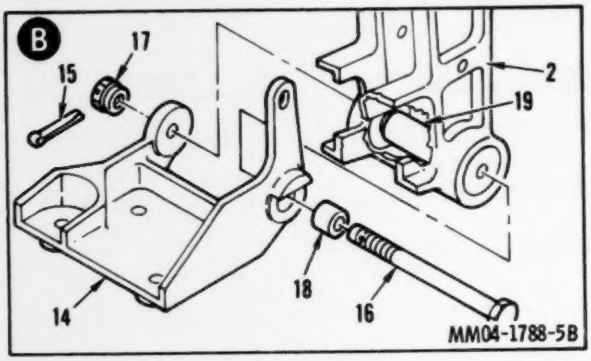
   b. Hold bolt (16). Remove nut (17).

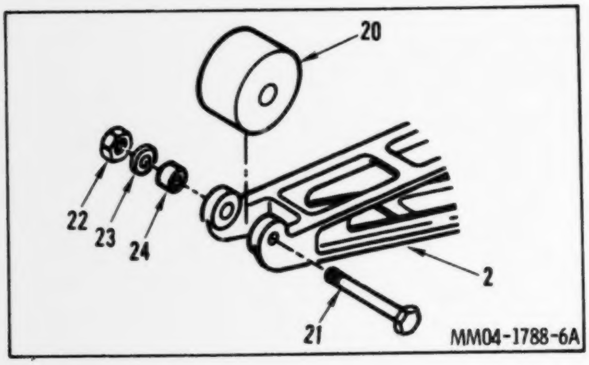
   c. Remove bolt (16), bushing (18), and internal spacer (19).

4. **Remove counterbalance weight (20) from bellcrank (2).**

   a. Hold bolt (21). Remove nut (22).

   b. Remove bolt (21), washer (23), bushing (24), and weight (20).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check parts removed and mounting area for damage** (para 11-5-1).

2. **Check parts removed and mounting area for corrosion** (para 1-5-38).

END OF TASK

11-5-38. DIRECTIONAL FS 215 BELLCRANK INSTALLATION 11-5-38

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque	5120-00-542-4489

Materials/Parts:

Cotter Pin (3)

Personnel Required:

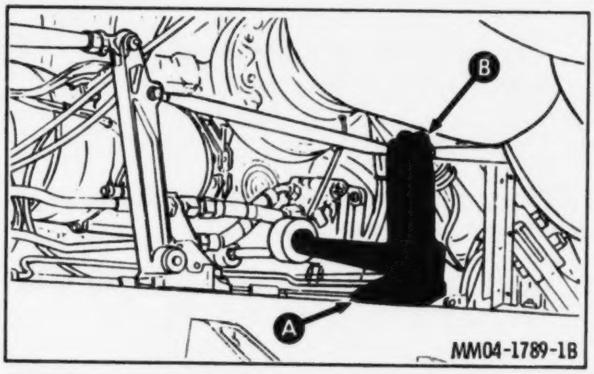
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

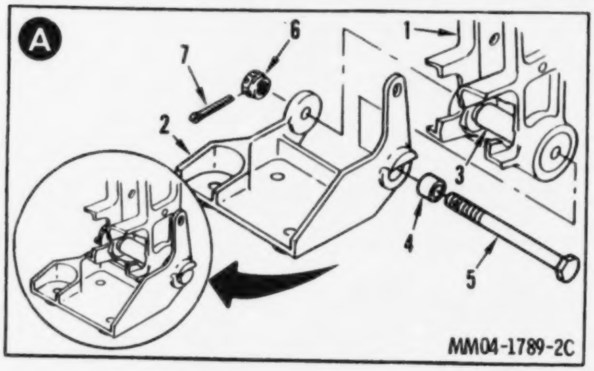
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Install directional control bellcrank (1) on bracket (2).**
   a. Aline internal spacer (3) in bellcrank (1).
   b. Aline bellcrank (1) with bracket (2).
   c. Install bushing (4) in bellcrank (1).
   d. Install bolt (5) through bellcrank (1), bushing (4), internal spacer (3), and bracket (2) (para 11-2-1).
   e. Hold bolt (5). Install nut (6).
   f. Install new cotter pin (7).

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11-5-38. DIRECTIONAL FS 215 BELLCRANK INSTALLATION (cont) 11-5-38

2. **Connect aft push-pull rod (8) to bellcrank (1).**

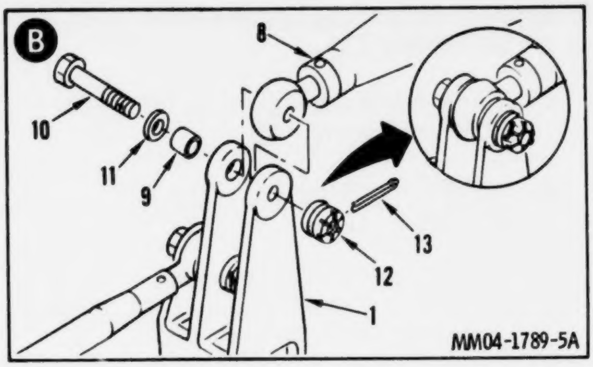
   a. Aline rod (8) with bellcrank (1).

   b. Install bushing (9) in bellcrank (1).

   c. Install bolt (10) through washer (11), bushing (9), bellcrank (1) and rod (8).

   d. Hold bolt (10). Install nut (12).

   e. Install new cotter pin (13).



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3. **Connect forward push-pull rod (14) to bellcrank (1).**

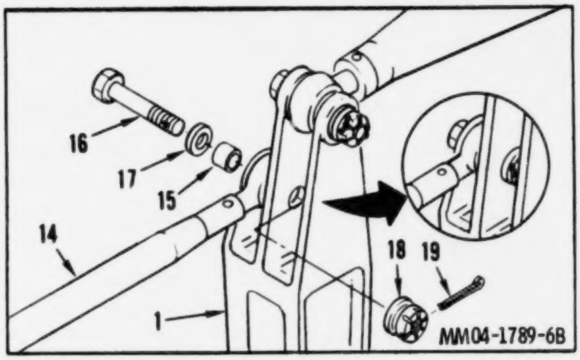
   a. Aline rod (14) with bellcrank (1).

   b. Install bushing (15) in bellcrank (1).

   c. Install bolt (16) through washer (17), bushing (15), bellcrank (1), and rod (14).

   d. Hold bolt (16). Install nut (18).

   e. Install new cotter pin (19).



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11-5-38. DIRECTIONAL FS 215 BELLCRANK INSTALLATION (cont) 11-5-38

4. **Install counterbalance weight (20) on bellcrank (1).**

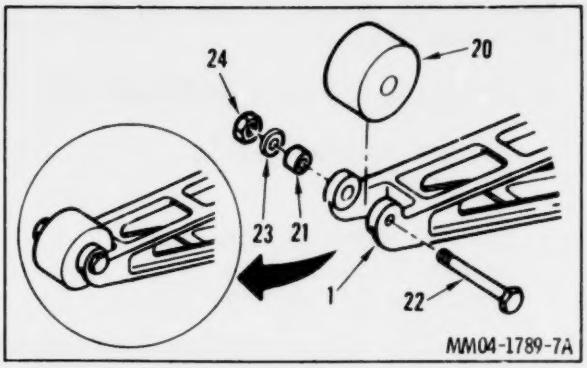
   a. Aline counterbalance weight (20) with bellcrank (1).

   b. Install bushing (21) in bellcrank (1).

   c. Install bolt (22) through bellcrank (1), bushing (21), and counterbalance weight (20).

   d. Hold bolt (22). Install washer (23) and nut (24).

   e. Torque nut (24) to **150 INCH-POUNDS.**



5. **Inspect (TI).**

6. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

7. **Secure access panel** L200 (para 2-2-2).

END OF TASK

11-5-39. DIRECTIONAL FS 275 BELLCRANK REMOVAL 11-5-39

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

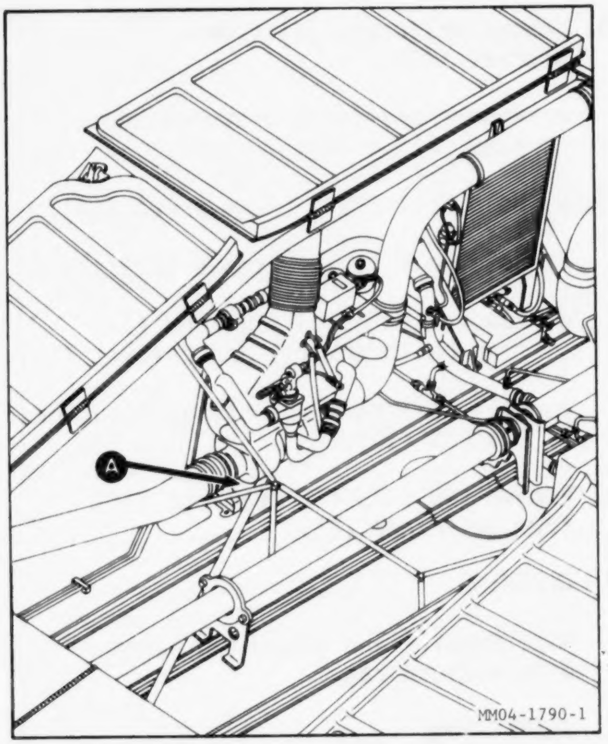
67R10 Attack Helicopter Repairer

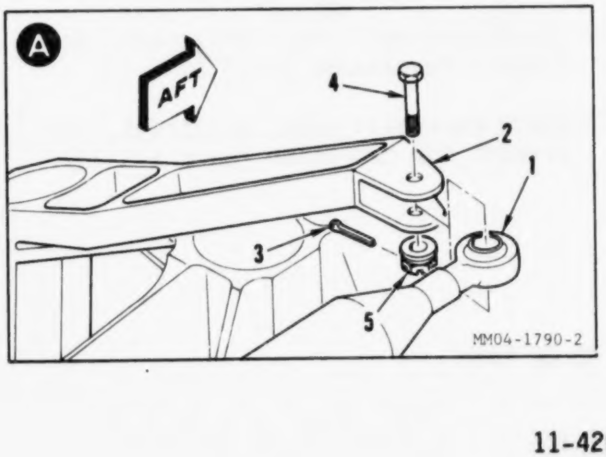
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and T325 opened
2-3-10	Catwalk center section removed
13-2-2	ENCU removed

A. REMOVAL

1. **Disconnect forward push-pull rod (1) from directional bellcrank (2).**
    a. Remove and discard cotter pin (3).
    b. Hold bolt (4). Remove nut (5).
    c. Remove bolt (4) from bellcrank (2) and rod (1).





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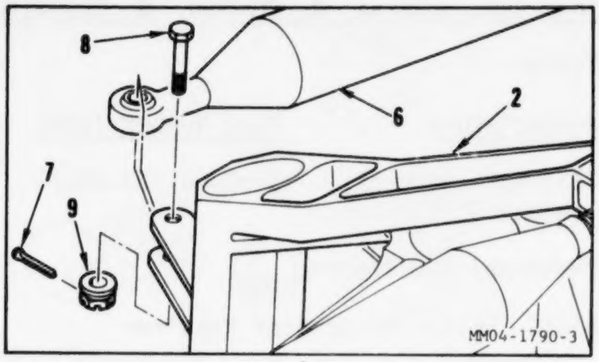
11-5-39. DIRECTIONAL FS 275 BELLCRANK REMOVAL (cont) 11-5-39

2. **Disconnect aft push-pull rod (6) from bellcrank (2).**

    a. Remove and discard cotter pin (7).

    b. Hold bolt (8). Remove nut (9).

    c. Remove bolt (8) from bellcrank (2) and rod (6).



3. **Remove bellcrank (2) from bracket (10).**

    a. Remove and discard two cotter pins (11).

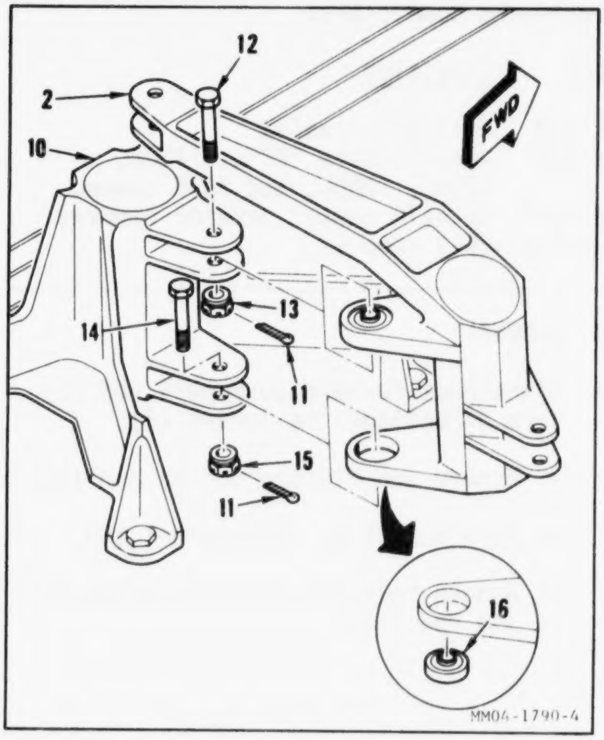
    b. Hold bolt (12). Remove nut (13).

    c. Hold bolt (14). Remove nut (15).

    d. Remove two bolts (12) and (14) from bellcrank (2) and bracket (10).

    e. Pull bellcrank (2) straight out of bracket (10).

4. **Remove two slip-fit bearings (16) from bellcrank (2).**



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check push-pull rods, bellcrank, and bracket for damage** (para 11-5-1).

2. **Check push-pull rods, bellcrank, and bracket for corrosion** (para 1-5-38).

END OF TASK

11-5-40. DIRECTIONAL FS 275 BELLCRANK INSTALLATION 11-5-40

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (4)

Personnel Required:

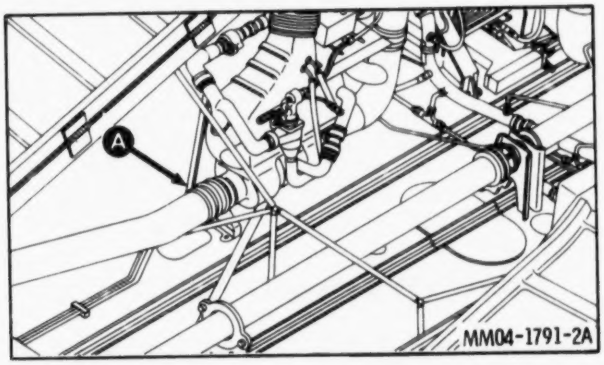
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

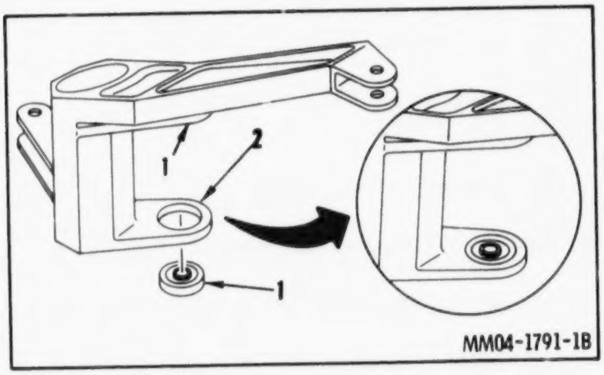
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. **Install two slip-fit bearings (1) into directional control bellcrank (2).**



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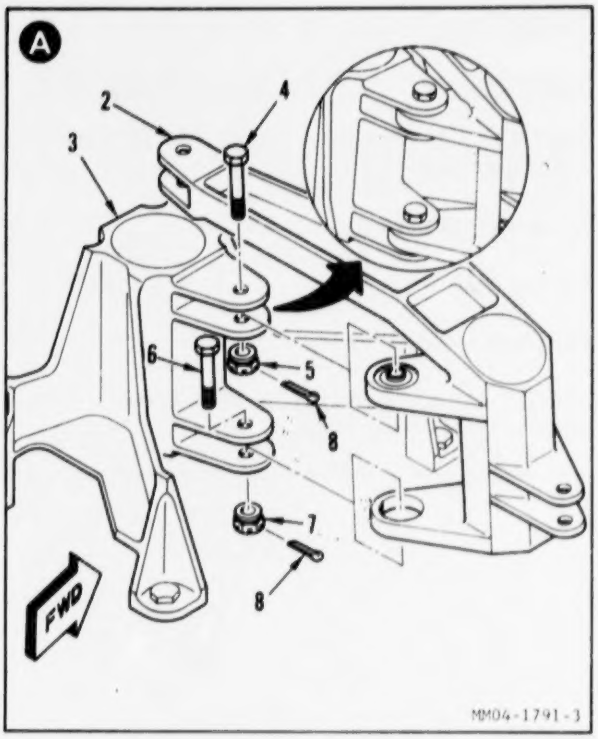
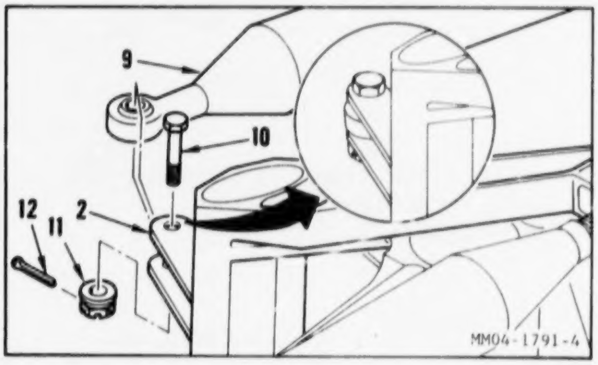
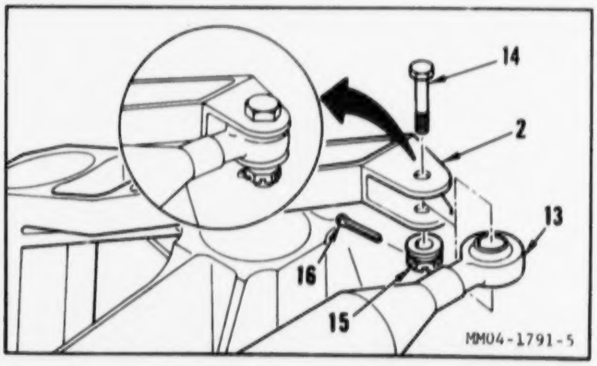
11-5-40. DIRECTIONAL FS 275 BELLCRANK INSTALLATION (cont) 11-5-40



2. **Install bellcrank (2) on bracket (3).**
   - a. Aline bellcrank (2) with bracket (3).
   - b. Install upper bolt (4) through bracket (3) and bellcrank (2).
   - c. Hold bolt (4) and install nut (5).
   - d. Install lower bolt (6) through bracket (3) and bellcrank (2).
   - e. Hold bolt (6). Install nut (7).
   - f. Install two new cotter pins (8).



3. **Install aft push-pull rod (9).**
   - a. Aline rod (9) with bellcrank (2).
   - b. Insert bolt (10) through bellcrank (2) and rod (9).
   - c. Hold bolt (10). Install nut (11).
   - d. Install new cotter pin (12).



4. **Install forward push-pull rod (13).**
   - a. Aline rod (13) with bellcrank (2).
   - b. Insert bolt (14) through bellcrank (2) and rod (13).
   - c. Hold bolt (14). Install nut (15).
   - d. Install new cotter pin (16).

GO TO NEXT PAGE

11-5-40. DIRECTIONAL FS 275 BELLCRANK INSTALLATION (cont) 11-5-40

5. Inspect (TI).

6. Install ENCU (para 13-2-2).

7. Secure catwalk center section (para 2-3-10).

8. Secure access doors T250L, T250R, T290L, T290R, and T325 (para 2-2-2).

9. Perform directional flight control rigging operational check (TM 55-1520-238-T).

END OF TASK

11-5-41. DIRECTIONAL FS 348 PUSH-PULL ROD WITH GUIDES REMOVAL 11-5-41

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control Systems	1730-01-240-1577

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairings T325, R410, R475, and L510 removed
1-7-18	External and primary hydraulic power provided

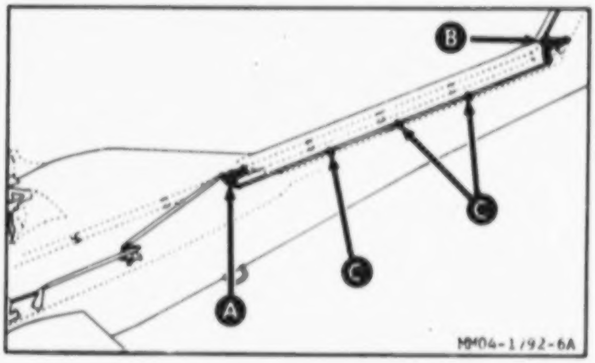
A. REMOVAL

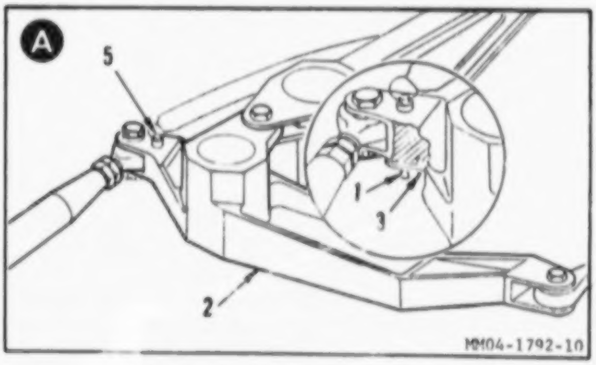
WARNING

Application of external power could cause injury to personnel. Make certain all switches and controls are in safed condition. Inform all persons working on helicopter each time external power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.





1. **Install -5 rig pin (1) in directional FS 215 bellcrank (2) and bracket (3).** Use control systems rigging kit.
   a. Locate bellcrank (2) and bracket (3).

NOTE

If rig pin hole in bellcrank (2) is not alined with hole in bracket (3), slowly move controls to aline holes.

   b. Install -5 rig pin (1) through bracket (3) and bellcrank (2).

GO TO NEXT PAGE

11-5-41. DIRECTIONAL FS 348 PUSH-PULL ROD WITH GUIDES REMOVAL (cont)

2. **Install -9 rig pin (4) in directional FS 520 bellcrank (5) and bracket (6).**

   a. Locate bellcrank (5) and bracket (6) on intermediate gearbox (7).

   b. Install -9 rig pin (4) through bracket (7) and bellcrank (5).

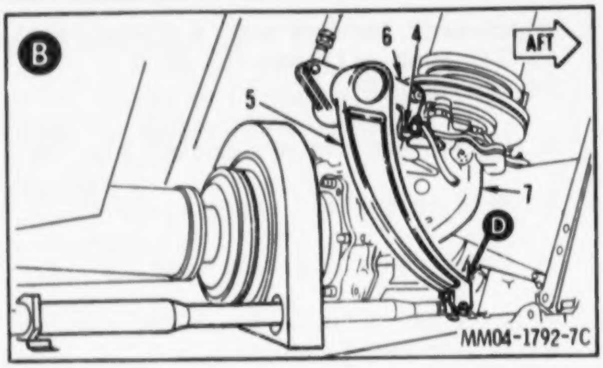
3. **Shut down hydraulic external power** (para 1-7-18).

4. **Disconnect aft end of FS 348 push-pull rod (8) from bellcrank (5).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10) and bushing (13).



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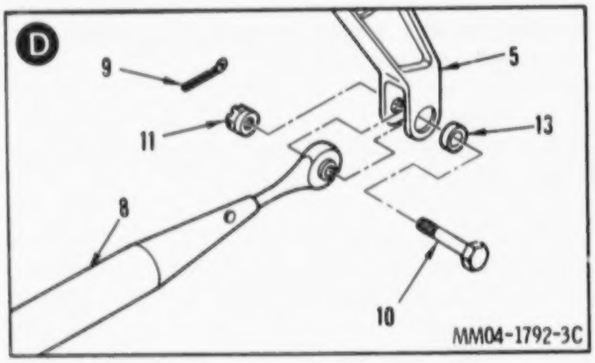

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11-5-41. DIRECTIONAL FS 348 PUSH-PULL ROD WITH GUIDES REMOVAL (cont) 11-5-41

5. **Disconnect forward end of directional FS 348 push-pull rod (8) from bellcrank (14).**

   a. Remove and discard cotter pin (15).

   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16) and bushing (18).

6. **Pull FS 348 push-pull rod (8) forward until aft end is clear.**

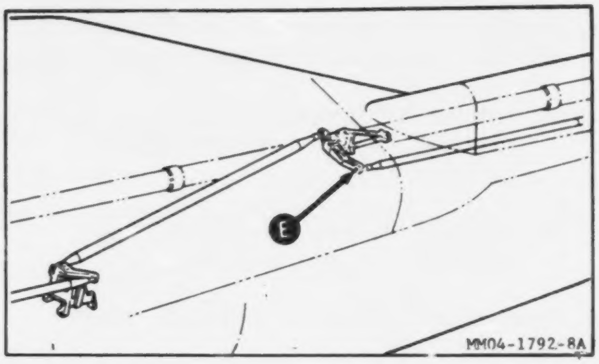
7. **Disconnect three guides (19) from guides mounts (20).**

   a. Remove six bolts (21) and washers (22) from inboard side of guide mounts (20).

   b. Remove three bolts (23) and washers (24) from outboard side of guide mounts (20) while lifting push-pull rod (8) until guides (18) are removed.

8. **Remove push-pull rod (8) with three guides (19) from helicopter.**

9. **Remove three guides (19) from push-pull rod (8).**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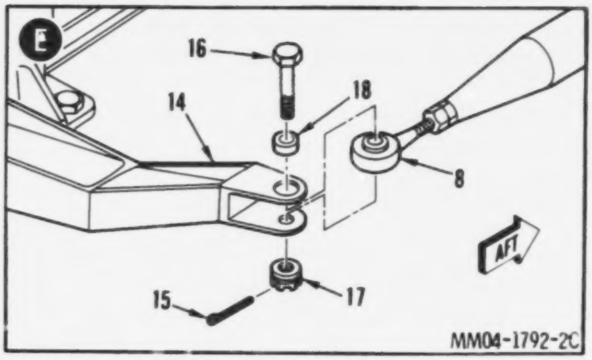
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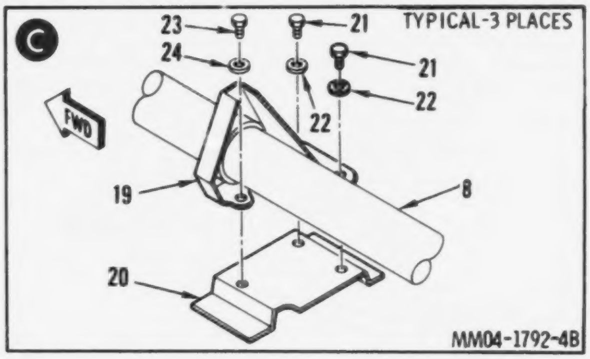
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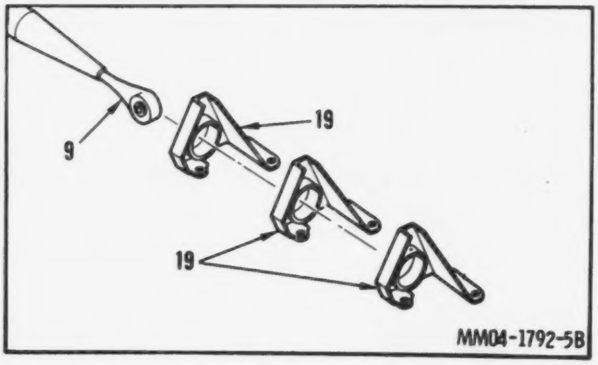
B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed and attaching parts for damage** (para 11-5-1).

2. **Check removed and attaching parts for corrosion** (para 1-5-38).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END OF TASK

11-5-42. DIRECTIONAL FS 348 PUSH-PULL ROD WITH GUIDES INSTALLATION 11-5-42

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489
Rigging Kit, Control Systems	1730-01-240-1577

Materials/Parts:

Cotter Pin (2)

Personnel Required:

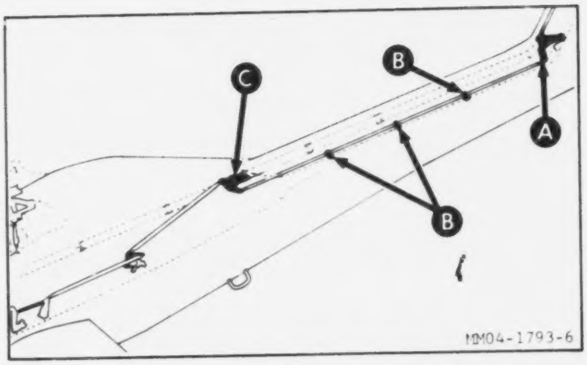
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

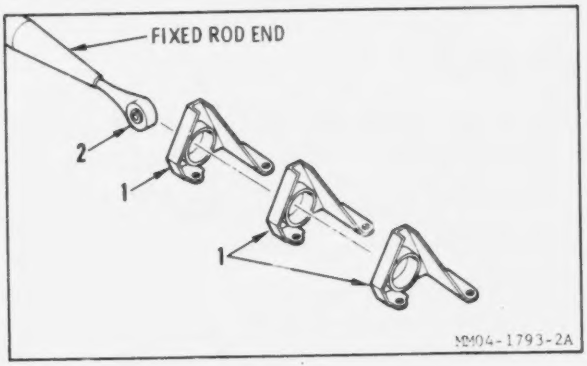
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. Position three guides (1) on directional FS 348 push-pull rod (2).



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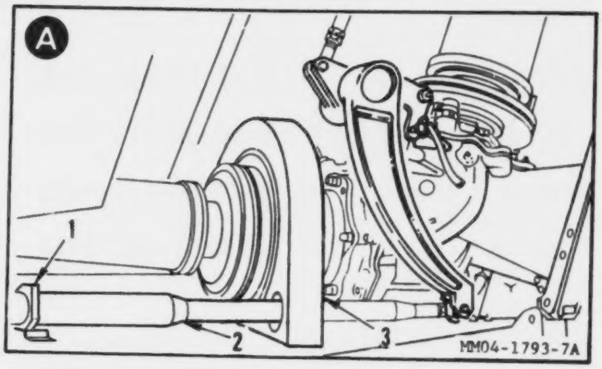
11-5-42. DIRECTIONAL FS 348 PUSH-PULL ROD ASSEMBLY WITH GUIDES INSTALLATION (cont) 11-5-42

2. **Position push-pull rod (2) with guides (1) along tail boom through diffuser (3) with adjustable end forward.**



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3. **Connect FS 348 push-pull rod (2) to aft bellcrank (4).** Torque nut (5) **30 to 40 INCH-POUNDS.**

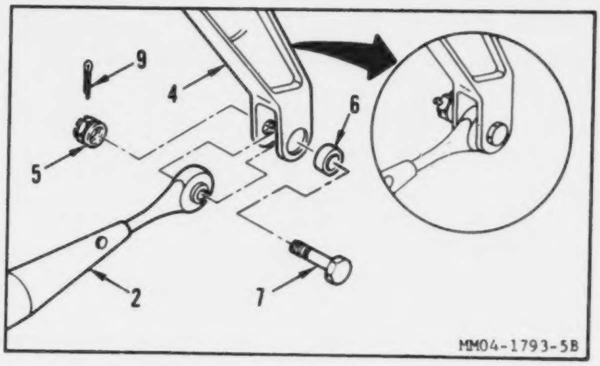
   a. Position rod (2) in bellcrank (4) Install bushing (6).

   b. Insert bolt (7) through bushing (6), bellcrank (4), and rod (2).

   c. Hold bolt (7). Install nut (5). Torque nut (5) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install cotter pin (9).



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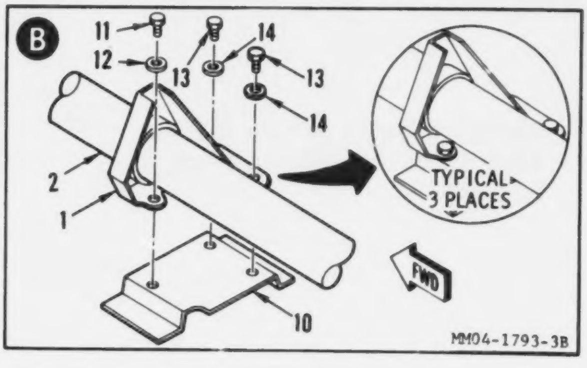
4. **Install three guides (1) on three guide mounts (10).**

   a. Aline three guides (1) with three guide mounts (10).

   b. Install three bolts (11) through three washers (12), guides (1), and outboard side of guide mounts (10).

   c. Install six bolts (13) through six washers (14), guides (1), and inboard side of guide mounts (10).



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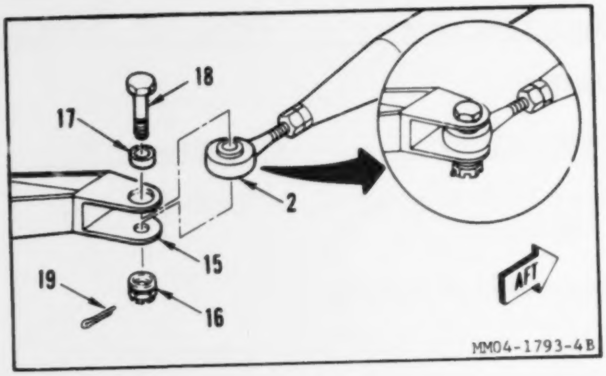
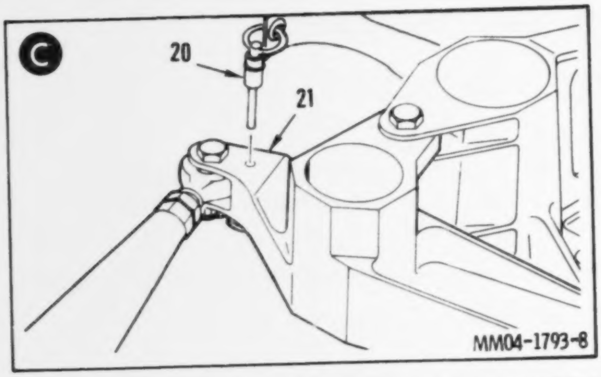
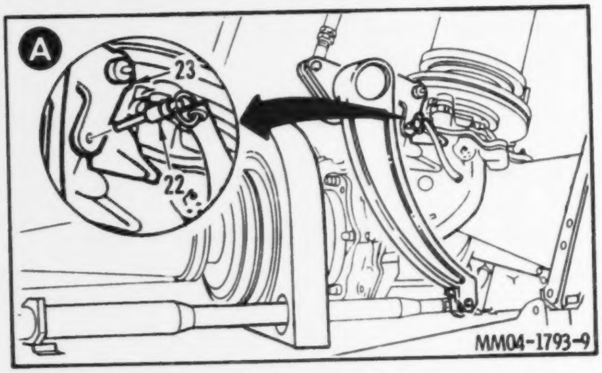
11-5-42. DIRECTIONAL FS 348 PUSH-PULL ROD ASSEMBLY WITH GUIDES INSTALLATION (cont) 11-5-42







5. **Connect adjustable end of FS 348 push-pull rod (2) to forward bellcrank (15). Torque nut (16) 30 to 40 INCH-POUNDS.**

   a. Position rod (2) in bellcrank (15). Install bushing (17).

   b. Insert bolt (18) through bushing (17), bellcrank (15), and rod (2).

   NOTE

   If bolt holes do not aline adjust FS 348 push-pull rod (2) (para 11-2-2).

   c. Hold bolt (18). Install nut (16). Torque nut (16) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (19).

6. **Remove rig pin (20) from bellcrank (21).**

7. **Remove rig pin (22) from bellcrank (23).**

8. **Inspect (TI).**

9. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

10. **Secure access fairings T325, R410, R475, and L510** (para 2-2-2).

END OF TASK

11-5-43. DIRECTIONAL FS 164 PUSH-PULL ROD REMOVAL 11-5-43

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

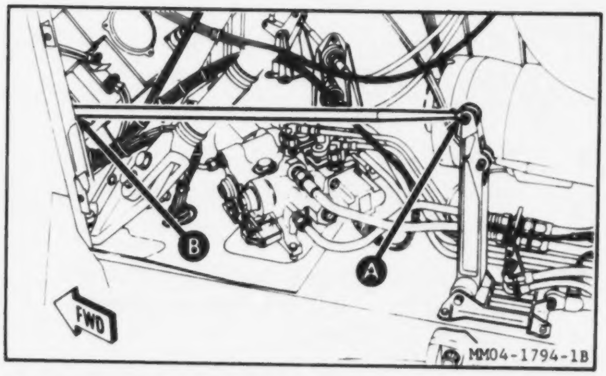
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

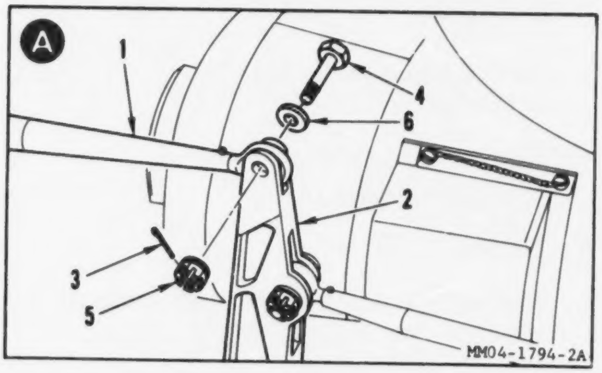
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed
9-5-5	No. 1 Transformer-rectifier removed

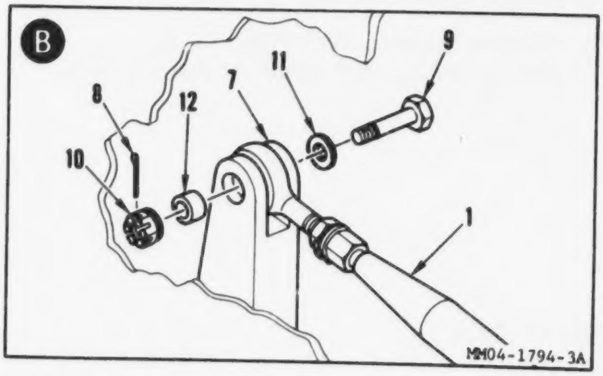


A. REMOVAL

1. **Disconnect directional control push-pull rod (1) from aft bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4) and washer (6).



2. **Disconnect push-pull rod (1) from forward bellcrank (7).**
   a. Remove and discard cotter pin (8).
   b. Hold bolt (9). Remove nut (10).
   c. Remove bolt (9), washer (11) and bushing (12).
   d. Remove push-pull rod (1).



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11-5-43. DIRECTIONAL FS 164 PUSH-PULL ROD REMOVAL (cont) 11-5-43

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check push-pull rod, bellcranks, and attaching parts for damage (para 11-5-1).
2. Check push-pull rod, bellcranks, and attaching parts for corrosion (para 1-5-38).

END OF TASK

11-5-44. DIRECTIONAL FS 164 PUSH-PULL ROD INSTALLATION 11-5-44

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque	5120-00-542-4489

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Connect adjustable end of directional control push-pull rod (1) to forward bellcrank (2).** Torque nut (3) **30 to 40 INCH-POUNDS.**

   a. Aline rod (1) with bellcrank (2).

   b. Insert bolt (4) through washer (5), bellcrank (2) and rod (1) (para 11-2-1).

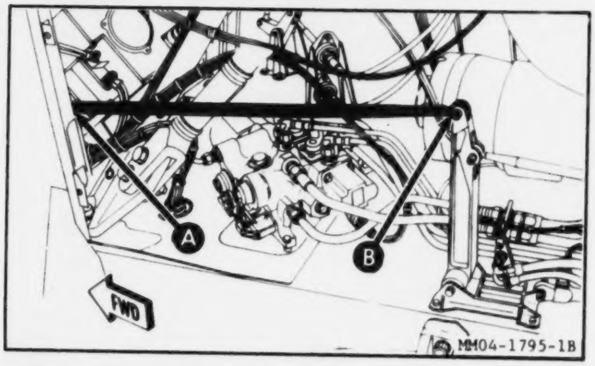
   c. Install bushing (6) in bellcrank (2).

   d. Hold bolt (4). Install nut (3).

   e. Torque nut (3) to **30 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   g. Install new cotter pin (7).



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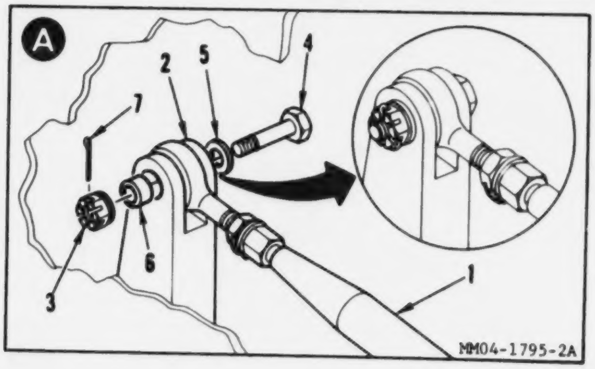

MM04-1795-2A

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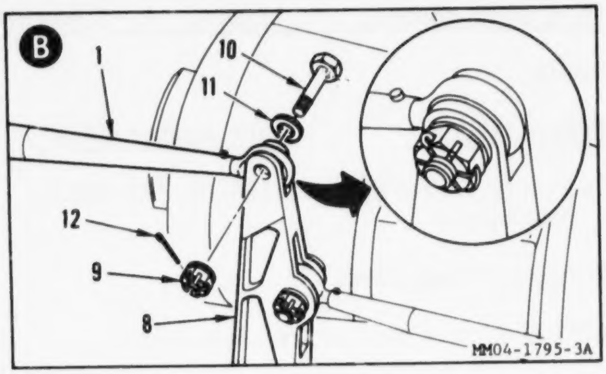
11-5-44. DIRECTIONAL FS 164 PUSH-PULL ROD INSTALLATION (cont) 11-5-44

2. **Connect push-pull rod (1) to aft bellcrank (8).** Torque nut (9) **30 to 40 INCH-POUNDS.**



   a. Aline rod (1) with aft bellcrank (8).

   b. Insert bolt (10) through washer (11), bellcrank (8) and rod (1) (para 11-2-1).

   c. Hold bolt (10). Install nut (9).

   d. Torque nut (9) to **30 INCH-POUNDS.**

   e. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   f. Install new cotter pin (12).

3. **Inspect (TI).**

4. **Perform directional flight controls rigging operational check** (TM 55-1520-238-T).

5. **Install No. 1 transformer-rectifier** (para 9-5-5).

6. **Secure access panel L200** (para 2-2-2).

END OF TASK

11-5-45. DIRECTIONAL FS 199 PUSH-PULL ROD REMOVAL 11-5-45

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

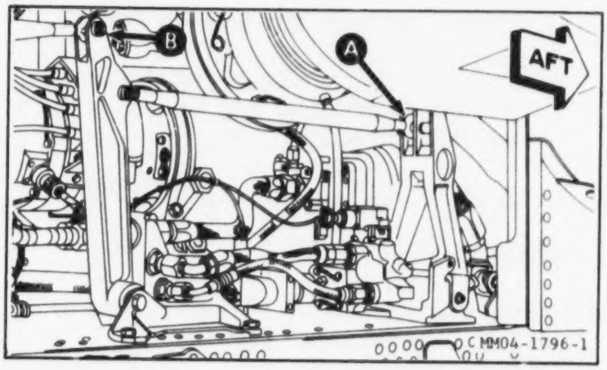
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

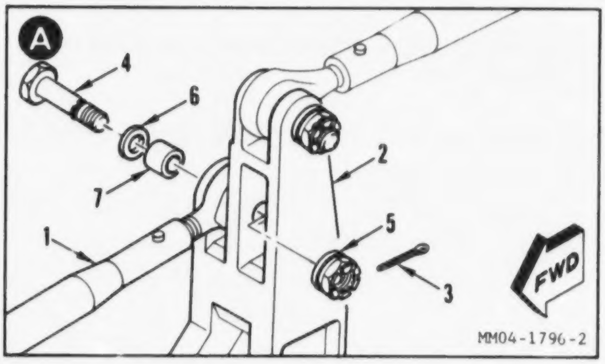
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed

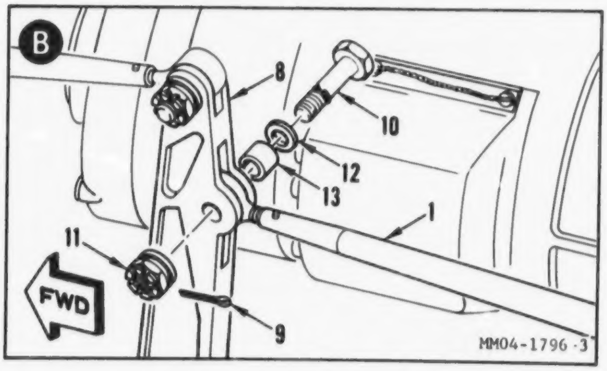


A. REMOVAL

1. **Disconnect directional control push-pull rod (1) from aft bellcrank (2).**
   - a. Remove and discard cotter pin (3).
   - b. Hold bolt (4). Remove nut (5).
   - c. Remove bolt (4), washer (6), and bushing (7).



2. **Disconnect push-pull rod (1) from forward bellcrank (8).**
   - a. Remove and discard cotter pin (9).
   - b. Hold bolt (10). Remove nut (11).
   - c. Remove bolt (10), washer (12), and bushing (13).
   - d. Remove push-pull rod (1).



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11-5-45. DIRECTIONAL FS 199 PUSH-PULL ROD REMOVAL (cont) 11-5-45

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check push-pull rod, bellcrank, and attaching parts for damage and wear (para 11-5-1).
2. Check push-pull rod, bellcrank, and attaching parts for corrosion (para 1-5-38).

END OF TASK

11-5-46. DIRECTIONAL FS 199 PUSH-PULL ROD INSTALLATION 11-5-46

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

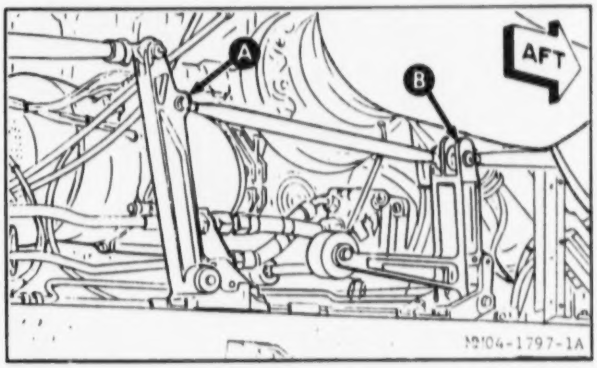
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

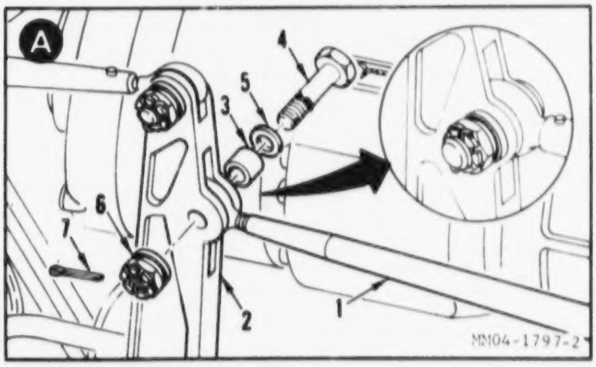
References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Connect directional control push-pull rod (1) to forward bellcrank (2).**
   a. Aline rod (1) with bellcrank (2).
   b. Install bushing (3) in bellcrank (2).
   c. Insert bolt (4) through washer (5), bushing (3), bellcrank (2) and rod (1).
   d. Hold bolt (4). Install nut (6).
   e. Install new cotter pin (7).

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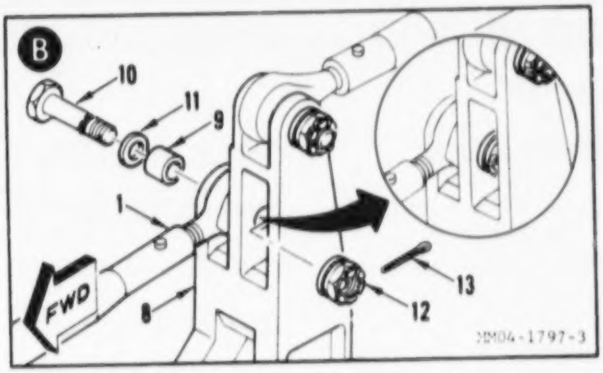
11-5-46. DIRECTIONAL FS 199 PUSH-PULL ROD INSTALLATION (cont) 11-5-46



2. **Connect push-pull rod (1) to aft bellcrank (8).**

   a. Aline rod (1) with bellcrank (8).

   b. Install bushing (9) in bellcrank (8).

   c. Insert bolt (10) through washer (11), bellcrank (8), bushing (9), and rod (1).

   d. Hold bolt (10). Install nut (12).

   e. Install new cotter pin (13).

3. **Inspect (TI).**

4. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

5. **Secure access panel L200** (para 2-2-2).

END OF TASK

11-5-47. DIRECTIONAL FS 215 PUSH-PULL ROD REMOVAL 11-5-47

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Aviation Ground Power Unit (AGPU)	1730-01-144-1897
Rigging Kit Control Systems	1730-01-240-1577

Equipment Conditions:

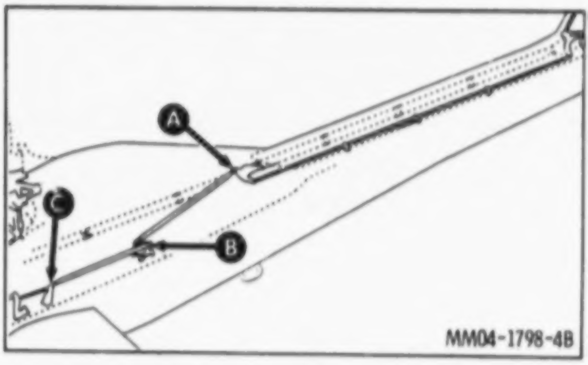
Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed; doors T250L, T250R, T290L, T290R, and L325 opened
2-3-10	Catwalk center section removed

Personnel Required:

67R10 Attack Helicopter Repairer (2)
One to assist

A. REMOVAL

1. **Apply external hydraulic power (para 1-7-18).**



MM04-1798-4B

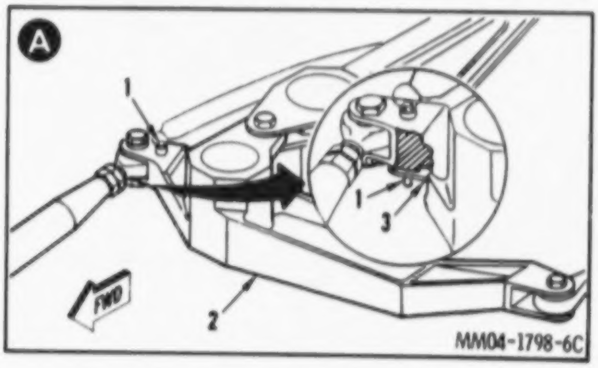
2. **Install -9 rig pin (1) in directional FS 348 bellcrank (2) and bracket (3).** Use control systems rigging kit.

   a. Locate bellcrank (2) and bracket (3).

   NOTE

   If rig pin hole in bellcrank does not aline with mid-stroke hole in bracket, slowly move controls to aline holes.

   b. Install -9 rig pin (1) through bracket (3) and bellcrank (2).



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11-5-47. DIRECTIONAL FS 215 PUSH-PULL ROD REMOVAL (cont) 11-5-47

3. **Shut down hydraulic external power** (para 1-7-18).

4. **Disconnect aft end of directional push-pull rod (4) from FS 275 bellcrank (5).**

   a. Remove and discard cotter pin (6).

   b. Hold bolt (7). Remove nut (8).

   c. Remove bolt (7) and bushing (9) from bellcrank (5).

5. **Disconnect forward end of push-pull rod (4) from FS 215 bellcrank (10).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (12). Remove nut (13).

   c. Remove bolt (12), washer (14), and bushing (15) from bellcrank (10).

6. **Remove FS 215 bellcrank (10)** (para 11-5-37).

7. **Remove push-pull rod (4) from bellcrank (5).** Pull rod (4) out through access door L200 opening.

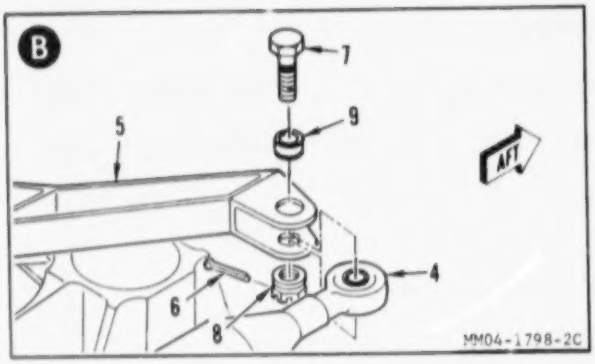
B. **CLEANING**

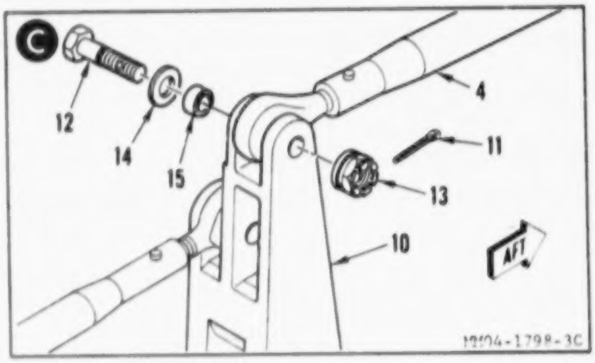
Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed and attaching parts for damage and wear** (para 11-5-1).

2. **Check removed and attaching parts for corrosion** (para 1-5-38).





END OF TASK

11-5-48. DIRECTIONAL FS 215 PUSH-PULL ROD INSTALLATION 11-5-48

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

References:

TM 55-1520-238-T

Materials/Parts:

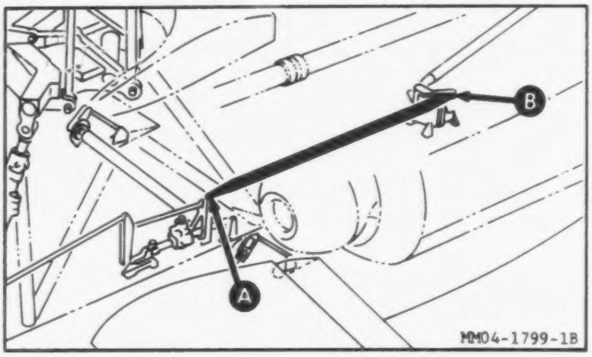
Cotter Pin (3)

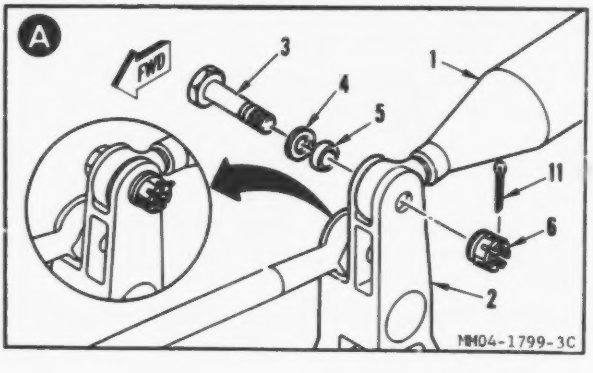
Personnel Required:

67R10	Attack Helicopter Repairer One to assist
66R30	Inspector/Supervisor

Equipment Condition:

Ref	Condition
1-7-2	Helicopter safed





1. **Insert directional control push-pull rod (1) through access door L200 opening.**

2. **Install FS 215 bellcrank (2)** (para 11-5-38).

3. **Connect forward FS 215 push-pull rod (1) to bellcrank (2).**

   a. Aline rod (1) with bellcrank (2).

   b. Insert bolt (3) through washer (4), bushing (5), bellcrank (2) and rod (1).

   c. Hold bolt (3). Install nut (6).

   d. Do not tighten nut (6).

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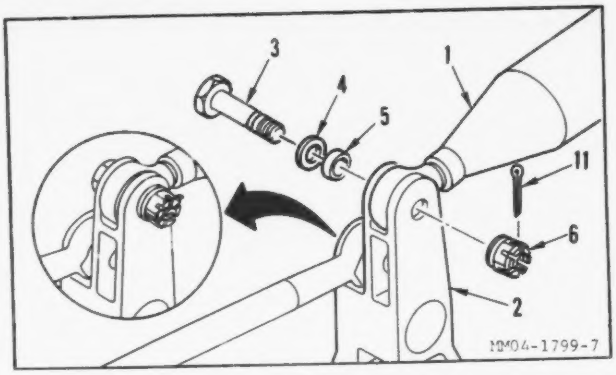
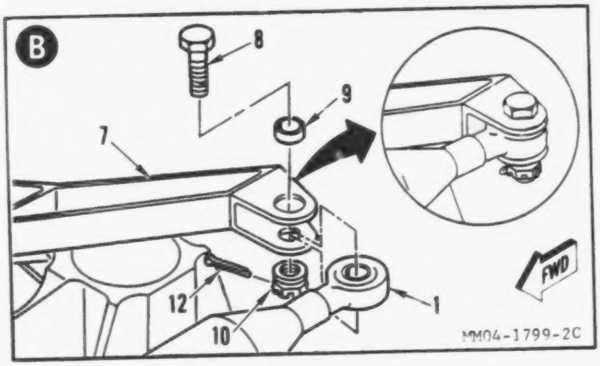
11-5-48. DIRECTIONAL FS 215 PUSH-PULL ROD INSTALLATION (cont) 11-5-48

4. **Connect aft push-pull rod (1) to FS 275 bellcrank (7).**
    a. Aline rod (1) with bellcrank (7).
    b. Insert bolt (8) through bushing (9) and bellcrank (7).
    c. Hold bolt (8). Install nut (10).
5. **Torque nuts (6) and (10) 30 to 40 INCH-POUNDS.**
    a. Hold bolt (3). Torque nuts (6) to 30 INCH-POUNDS.
    b. Hold bolt (8). Torque nut (10) to 30 INCH-POUNDS.
    c. Increase torque to aline cotter pin holes, but do not exceed 40 INCH-POUNDS.
    d. Install new cotter pin (11) in nut (6).
    e. Install new cotter pin (12) in nut (10).





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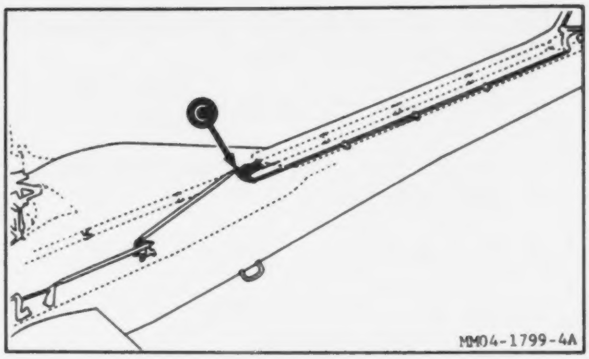
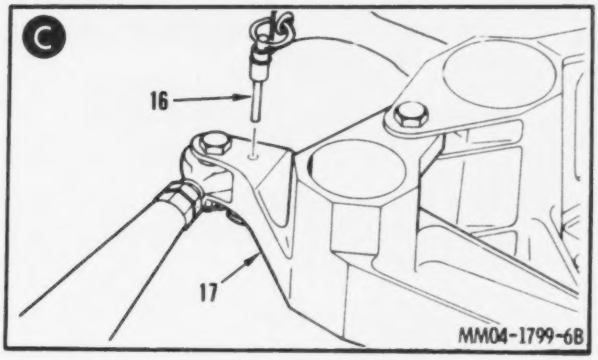
11-5-48. DIRECTIONAL FS 215 PUSH-PULL ROD INSTALLATION (cont) 11-5-48





6. Remove -9 rig pin (16) from directional FS 348 bellcrank (17) and bracket (18).
7. Inspect (TI).
8. Install catwalk center section (para 2-3-10).
9. Secure access panel L200 and doors T250L, T250R, T290L, T290R, and L325 (para 2-2-2).
10. Perform directional flight control rigging operational check (TM 55-1520-238-T).

END OF TASK

11-5-49. DIRECTIONAL FS 275 PUSH-PULL ROD REMOVAL 11-5-49

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit Flight Controls	1730-01-240-1577

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors T250L, T250R, T290L, T290R, and T325 opened; fairing T355 removed
1-7-18	External primary hydraulic power applied

GO TO NEXT PAGE

11-5-49. DIRECTIONAL FS 275 PUSH-PULL ROD REMOVAL (cont) 11-5-49

A. REMOVAL

WARNING

Application of external power could cause injury to personnel. Make certain all switches and controls are in safed condition. Inform all persons working on helicopter each time external power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. **Install -9 rig pin (1) in directional FS 348 bellcrank (2) and bracket (3).** Use control systems rigging kit.

NOTE

If pin hole in bellcrank is not alined with hole in bracket, slowly move controls to aline holes.

2. **Install -5 rig pin (4) in directional FS 215 bellcrank (5) and bracket (6).** Locate bellcrank (5) and bracket (6) on main deck (7).

3. **Shut down hydraulic external power (para 1-7-18).**

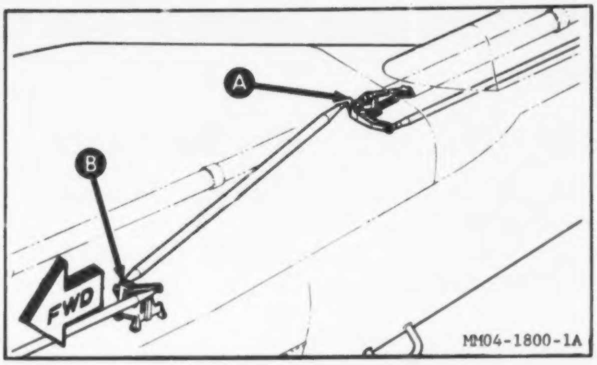
4. **Disconnect directional control push-pull rod (8) from forward bellcrank (5).**

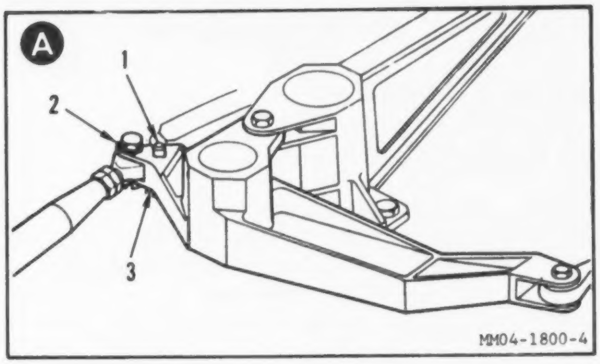
   a. Remove and discard cotter pin (9).

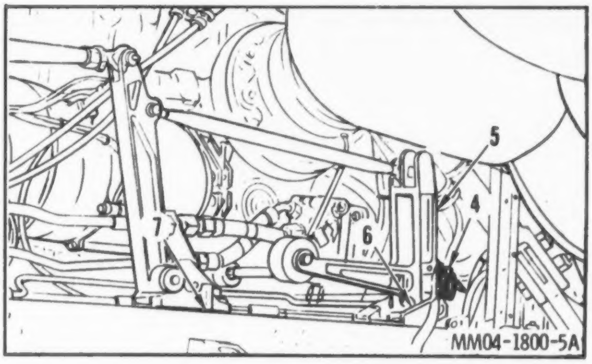
   b. Hold bolt (10). Remove nut (11).

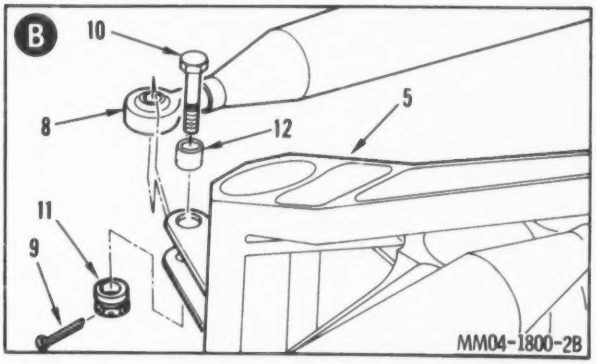
   c. Remove bolt (10).

   d. Remove bushing (12).









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11-5-49. DIRECTIONAL FS 275 PUSH-PULL ROD REMOVAL (cont) 11-5-49

5. **Disconnect push-pull rod (8) from aft bellcrank (2).**

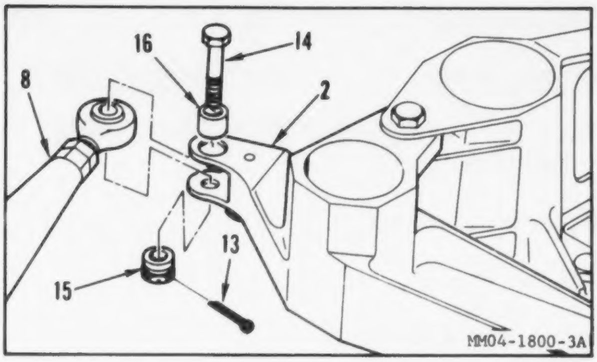
   a. Remove and discard cotter pin (13).

   b. Hold bolt (14). Remove nut (15).

   c. Remove bolt (14).

   d. Remove bushing (16).

6. **Slide push-pull rod (8) aft to remove from aircraft.**



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed and attaching parts for damage and wear** (para 11-5-1).

2. **Check removed and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-50. DIRECTIONAL FS 275 PUSH-PULL ROD INSTALLATION 11-5-50

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

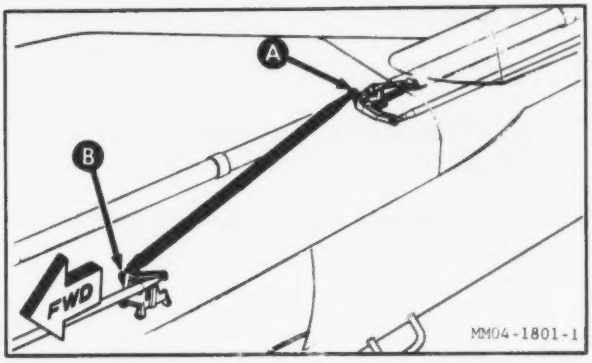
67R10 Attack Helicopter Repairer
66R30 Inspector/Supervisor

References:

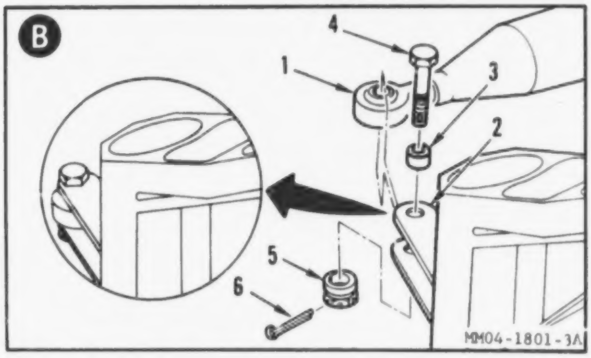
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. **Connect directional FS 275 push-pull rod (1) to forward bellcrank (2).**
   a. Aline rod (1) with bellcrank (2). Install bushing (3).
   b. Insert bolt (4) through bushing (3), bellcrank (2) and rod (1).
   c. Hold bolt (4). Install nut (5).
   d. Install new cotter pin (6).



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11-5-50. DIRECTIONAL FS 275 PUSH-PULL ROD INSTALLATION (cont) 11-5-50

2. **Connect adjustable end of directional control push-pull rod (1) to aft bellcrank (7).**

   a. Aline rod (1) with bellcrank (7) and install bushing (8).

   b. Insert bolt (9) through bushing (8), bellcrank (7) and rod (1). If bolt holes do not aline, adjust rod end (1) (para 11-2-2).

   c. Hold bolt (9). Install nut (10).

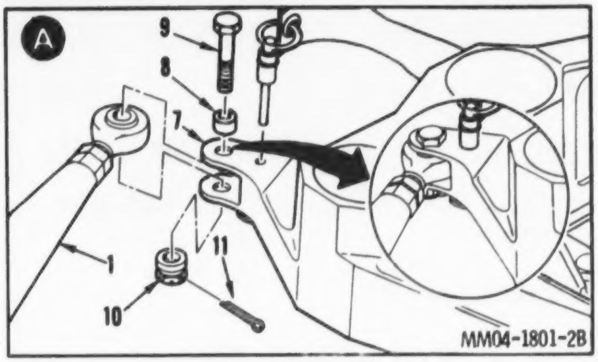
   d. Install new cotter pin (11).

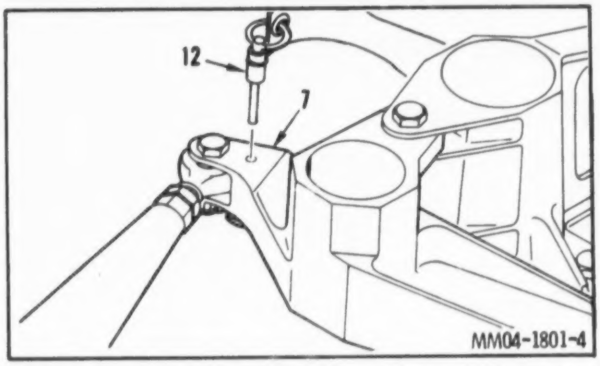
3. **Remove rig pins.**

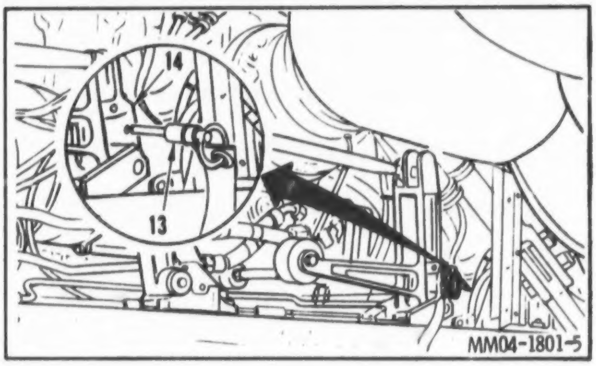
4. **Inspect (TI).**

5. **Perform directional flight control rigging operational check (TM 55-1520-238-T).**

6. **Secure access doors T250L, T250R, T290L, T290R, T325 and fairing T355 (para 2-2-2).**







END OF TASK

11-5-51. DIRECTIONAL FS 348 BELLCRANK REMOVAL 11-5-51

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

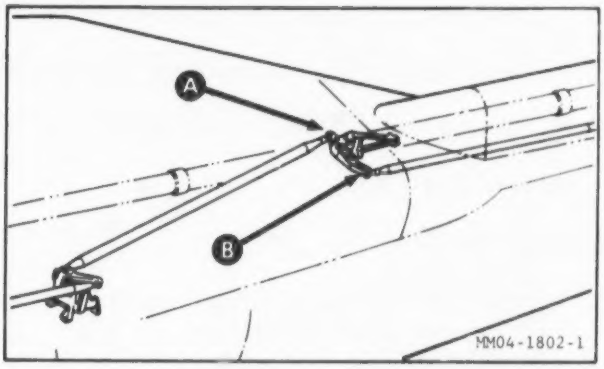
Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

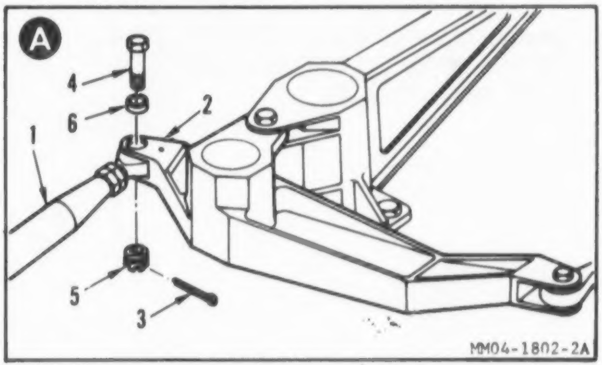
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access fairing T355 removed
2-2-2	Access fairing T325 open

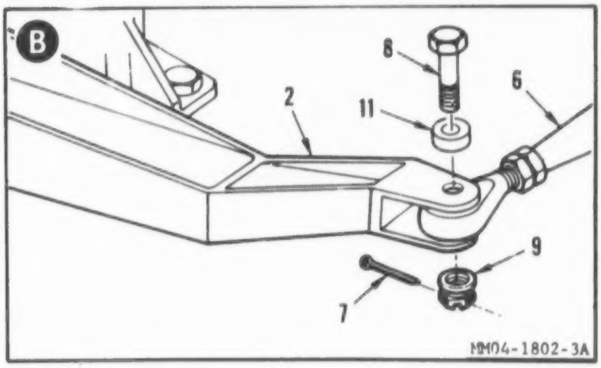


A. REMOVAL

1. **Disconnect forward push-pull rod (1) from directional bellcrank (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4) and bushing (6).



2. **Disconnect aft push-pull rod (6) from bellcrank (2).**
   a. Remove and discard cotter pin (7).
   b. Hold bolt (8). Remove nut (9).
   c. Remove bolt (8) and bushing (11).



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11-5-51. DIRECTIONAL FS 348 BELLCRANK REMOVAL (cont) 11-5-51

3. Remove bellcrank (2) from bracket (12).

a. Remove and discard cotter pin (13).

b. Hold bolt (14). Remove nut (15).

c. Remove bolt (14) and bushing (16).

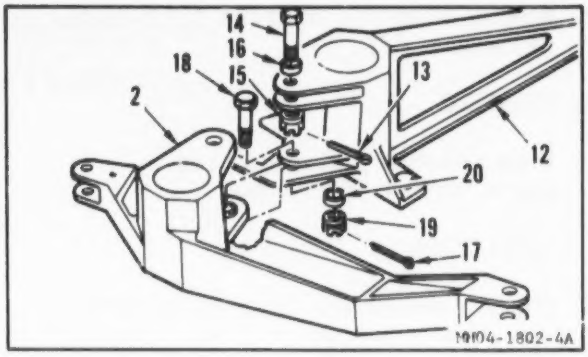
d. Remove and discard cotter pin (17).

e. Hold bolt (18). Remove nut (19).

f. Remove bolt (18).

g. Remove bushing (20).

h. Lift bellcrank (2) from bracket (12).



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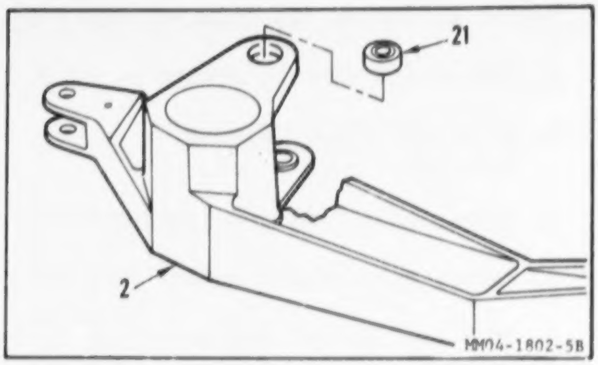
11-5-51. DIRECTIONAL FS 348 BELLCRANK REMOVAL (cont) 11-5-51

4. Remove slip-fit bearing (21) from bellcrank (2).



B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check removed and attaching parts for damage and wear (para 11-5-1).
2. Check removed and attaching parts for corrosion (para 1-5-38).

END OF TASK

11-5-52. DIRECTIONAL FS 348 BELLCRANK INSTALLATION 11-5-52

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (4)

Personnel Required:

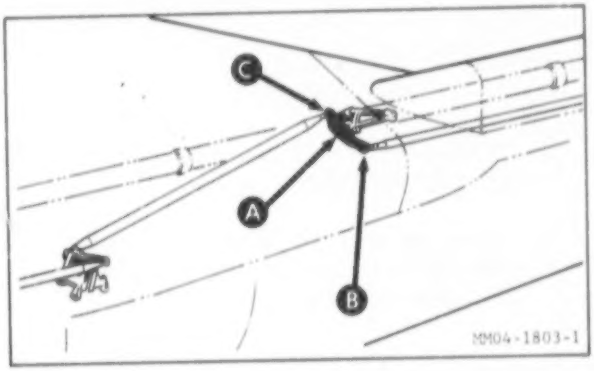
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

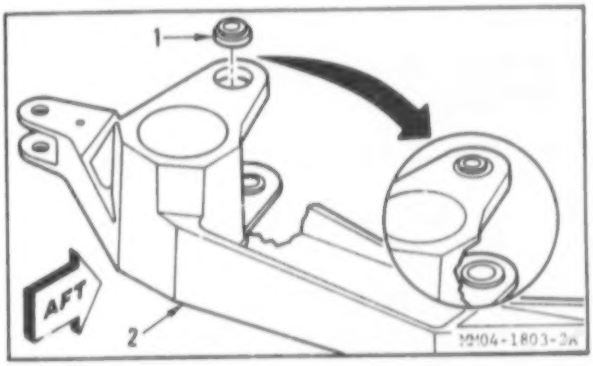
TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



1. Install slip-fit bearing (1) in directional bellcrank (2).



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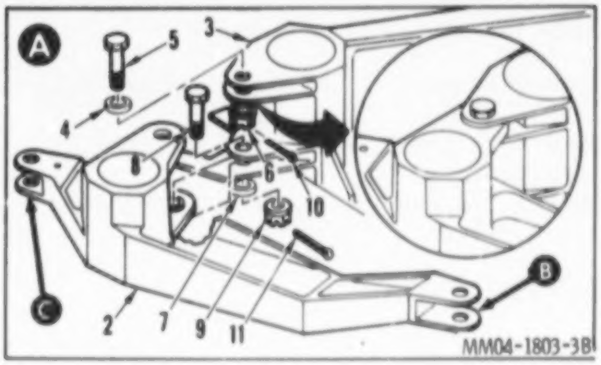
11-5-52. DIRECTIONAL FS 348 BELLCRANK INSTALLATION (cont) 11-5-52



2. **Install bellcrank (2) on bracket (3).**

   a. Aline bellcrank (2) with bracket (3).

   b. Install bushing (4) in bracket (3).

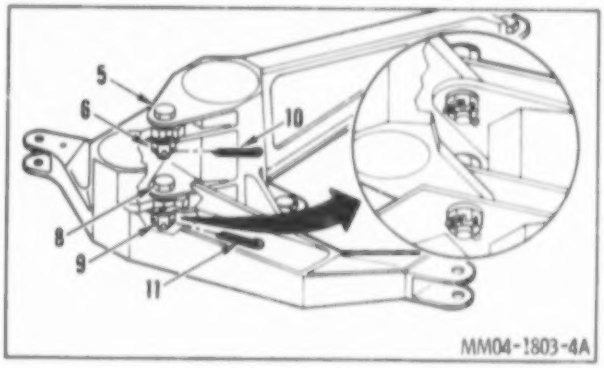
   c. Insert bolt (5) through bushing (4), bracket (3), and bellcrank (2).

   d. Hold bolt (5). Install nut (6).

   e. Install bushing (7) in bracket (3).

   f. Insert bolt (8) through bushing (7), bracket (3) and bellcrank (2).

   g. Hold bolt (8). Install nut (9).

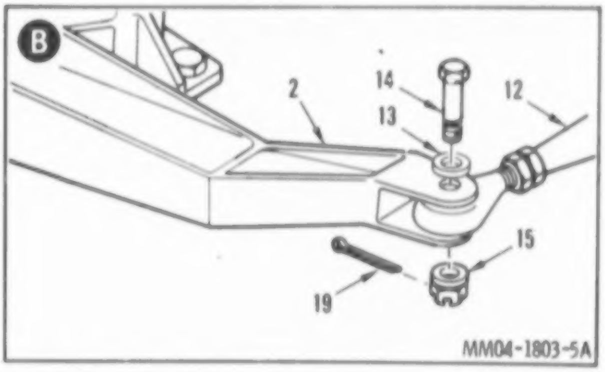


3. **Torque nuts (6) and (9) 30 to 40 INCH-POUNDS.**

   a. Torque nuts (6) and (9) to **30 INCH-POUNDS.**

   b. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   c. Install new cotter pins (10) and (11).



4. **Connect aft push-pull rod (12) to bellcrank (2).**

   a. Aline bellcrank (2) with rod (12)..

   b. Install bushing (13) in bellcrank (2).

   c. Insert bolt (14) through bushing (13), bellcrank (2) and rod (12).

   d. Hold bolt (14). Install nut (15).

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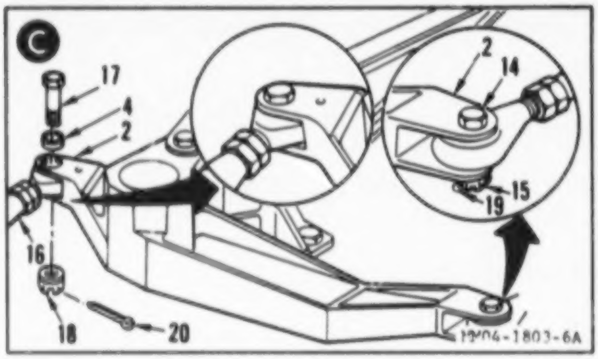
11-5-52. DIRECTIONAL FS 348 BELLCRANK INSTALLATION (cont) 11-5-52



5. **Connect forward push-pull rod (16) to bellcrank (2).**

   a. Aline rod (16) with bellcrank (2).

   b. Install bushing (4) in bellcrank (2).

   c. Insert bolt (17) through bushing (4) bellcrank (2) and rod (16).

   d. Hold bolt (17). Install nut (18).

6. **Torque nuts (15) and (18) 30 to 40 INCH-POUNDS.**

   a. Torque nuts (15) and (18) to **30 INCH-POUNDS.**

   b. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   c. Install new cotter pins (19) and (18).

7. **Inspect (TI).**

8. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

9. **Install access fairing T355** (para 2-2-2).

10. **Secure access fairing T325** (para 2-2-2).

END OF TASK

11-5-53. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL 11-5-53

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer (2)
One to assist

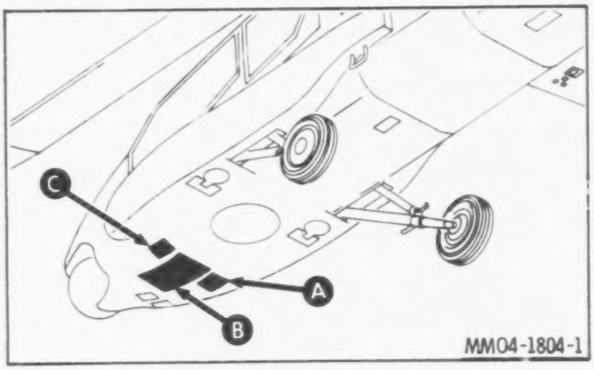
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access doors B60, B65L, and B65R opened; fairings L60 and R60 Removed.

A. REMOVAL

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

2. **Open ASE, AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**

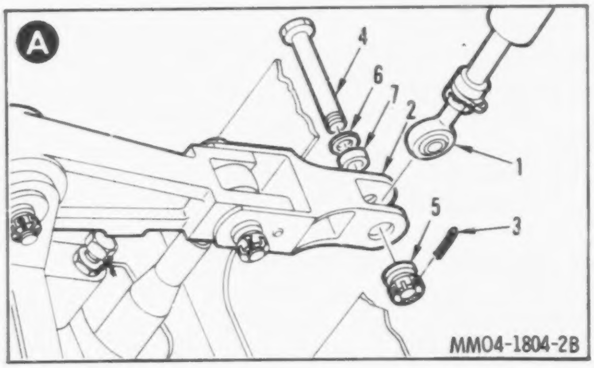


3. **Disconnect transducer input arm (1) from SPAD (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), and bushing (7).



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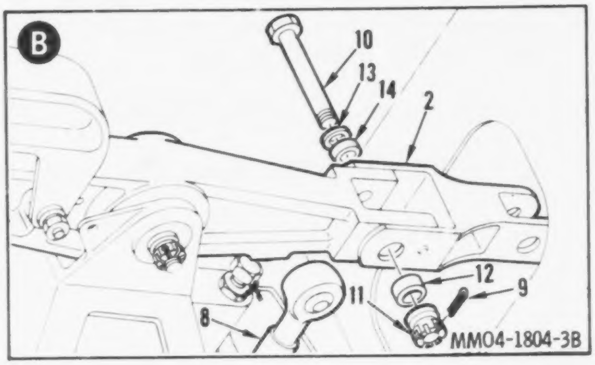
11-5-53. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont)

4. **Disconnect directional push-pull rod (8) from SPAD (2).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11) and bushing (12).

   c. Remove bolt (10) with washer (13) and bushing (14).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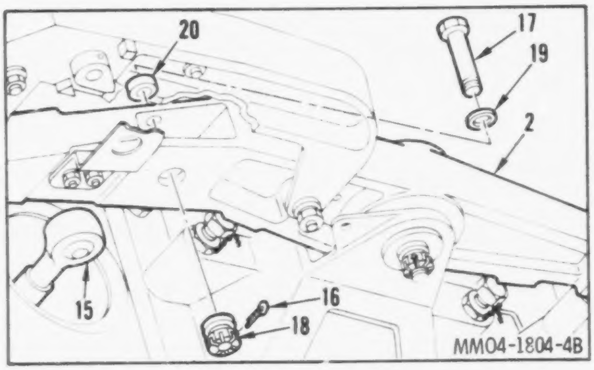
5. **Support SPAD (2) and disconnect directional push-pull rod (15) from SPAD (2).**

   a. Remove and discard cotter pin (16).

   b. Hold bolt (17). Remove nut (18).

   c. Remove bolt (17) with washer (19) and bushing (20).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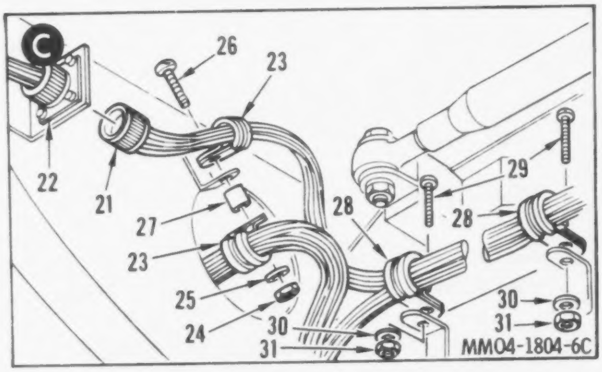
6. **Detach connector A334P1 (21) from connector J273 (22).**

7. **Remove two wire clamps (23).** Remove nut (24), washer (25), screw (26) and spacer (27).

8. **Remove two wire clamps (28).** Remove two screws (29), two washers (30) and two nuts (31).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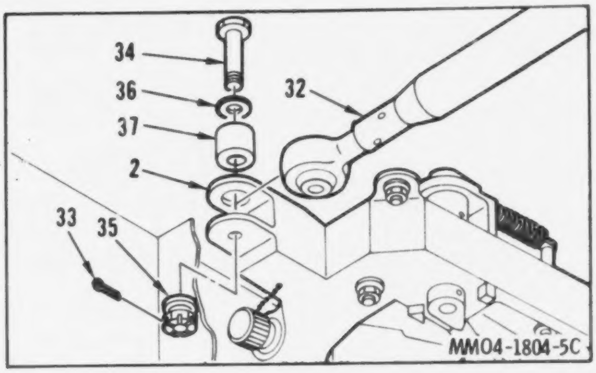
11-5-53. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont) 11-5-53

9. **Disconnect directional push-pull rod No. 3 (32) from SPAD (2).**

   a. Remove and discard cotter pin (33).

   b. Hold bolt (34). Remove nut (35).

   c. Remove bolt (34), washer (36), and bushing (37).



10. **Remove SPAD (2) from mounting bracket (38).**

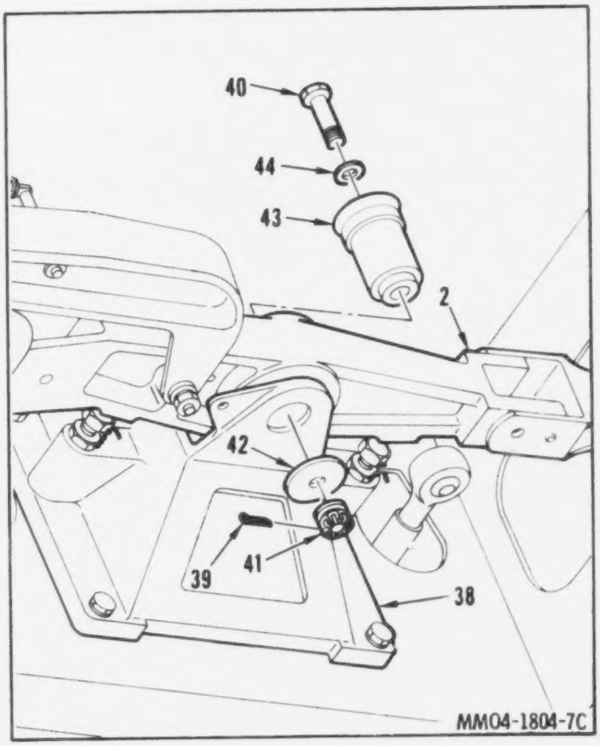
    a. Remove and discard cotter pin (39).

    b. Hold bolt (40).

    c. Remove nut (41) and retainer (42).

    d. Remove bolt (40) with shaft (43) and washer (44).

    e. Remove SPAD (2) from bracket (38).



B. **CLEANING**

Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed and attaching parts for damage and wear** (para 11-5-1).
2. **Check removed and attaching parts for corrosion** (para 1-5-38).
3. **Check retainer for damaged threads.** None allowed.

END OF TASK

11-5-54. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION 11-5-54

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (5)
Strap, Tiedown (E106)

Personnel Required:

67R10	Attack Helicopter Repairer (2) One person to assist
66R30	Inspector/Supervisor

References:

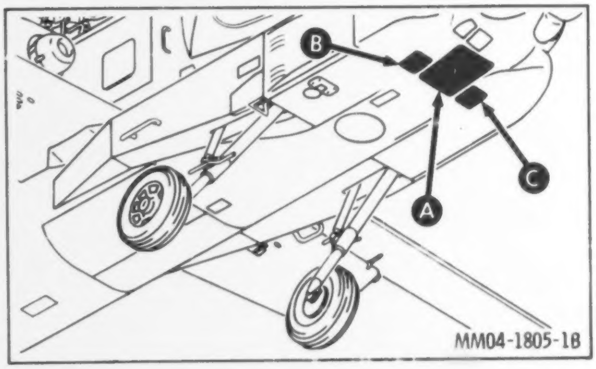
TM 55-1520-238-T

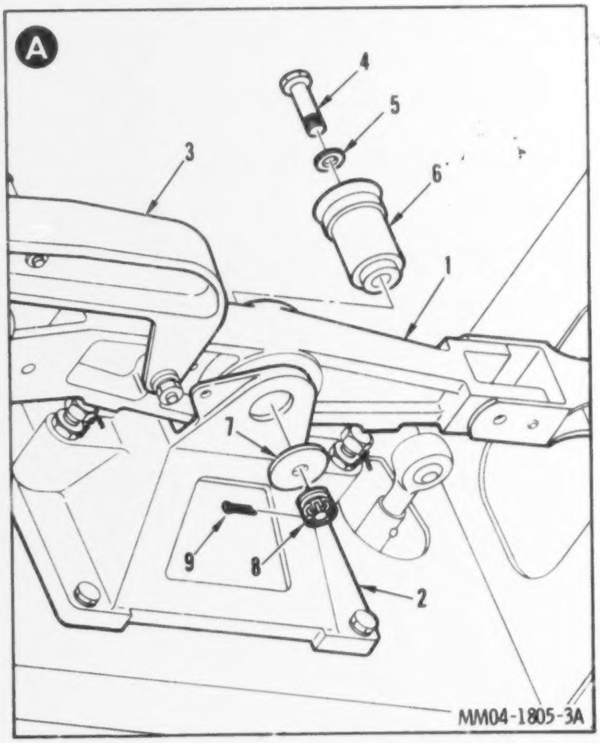
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

---

1. **Support and install SPAD (1) on mounting bracket (2).**
   - a. Position SPAD (1) on bracket (2) with swivel arm (3) to left.
   - b. Insert bolt (4) through washer (5) into shaft (6).
   - c. Insert shaft (6) with bolt (4) and washer (5) through bracket (2) and SPAD (1).
   - d. Hold bolt (4). Install retainer (7) and nut (8).
   - e. Install new cotter pin (9).





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11-5-54. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-54

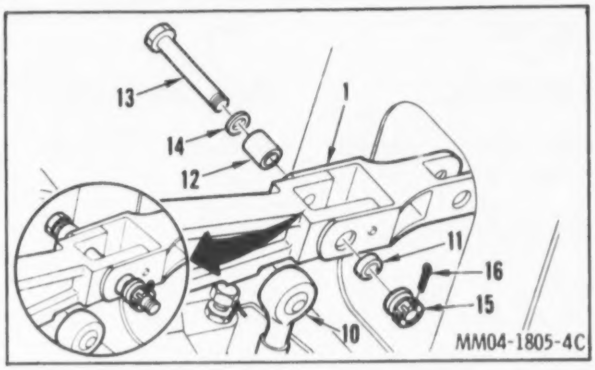
2. Connect directional push-pull rod (10) to SPAD (1).

a. Install bushings (11) and (12) in SPAD.

b. Insert bolt (13) through washer (14), bushing (12) SPAD (1), bushing (11) and rod (10).

c. Hold bolt (13). Install nut (15).

d. Install new cotter pin (16).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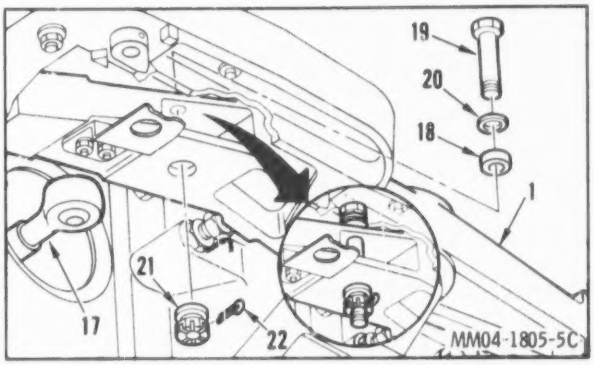
3. Connect directional push-pull rod (17) to SPAD (1).

a. Install bushing (18) in SPAD (1).

b. Insert bolt (19) through washer (20), bushing (18), SPAD (1), and rod (17).

c. Hold bolt (19). Install nut (21).

d. Install new cotter pin (22).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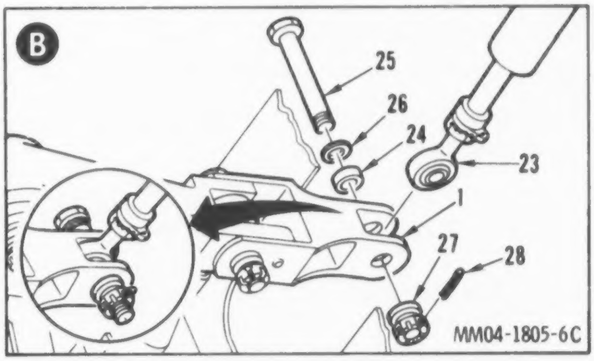
4. Connect position transducer (23) to SPAD (1).

a. Install bushing (24) in SPAD (1).

b. Insert bolt (25) through washer (26), bushing (24) SPAD (1), and transducer (23).

c. Hold bolt (25). Install nut (27).

d. Install new cotter pin (28).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11-5-54. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-54

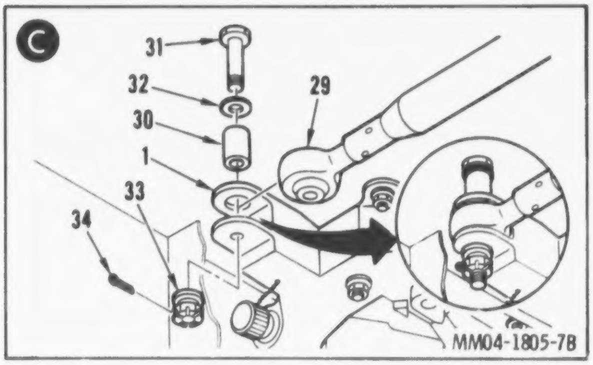
5. **Connect directional push-pull rod (29) to SPAD (1).**

   a. Install bushing (30) in SPAD (1).

   b. Insert bolt (31) through washer (32), bushing (30), SPAD (1) and rod (29).

   c. Hold bolt (31). Install nut (33).

   d. Install new cotter pin (34).



6. **Attach connector A334 P1 (35) to connector J273 (36).**

7. **Install two wire clamps (37).** Install two screws (38), two washers (39) and two nuts (40)

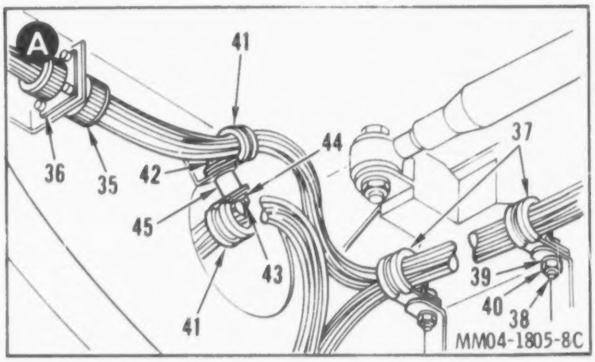
8. **Install two wire clamps (41).** Install spacer (45), screw (42), washer (44) and nut (43).

9. Inspect (TI).

10. **Perform flight control system operational check** (TM 55-1520-238-T).

11. **Perform directional flight control rigging operational check** (TM 55-1510-238-T).

12. **Secure access panels B60, B65L, B65R, and fairings L60 and R60.** (para 2-2-2).



END OF TASK

11-5-55. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT 11-5-55

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Shear Pin
	Cotter Pin
(E16)	Petrolatum
(E34)	Lockwire

Personnel Required:

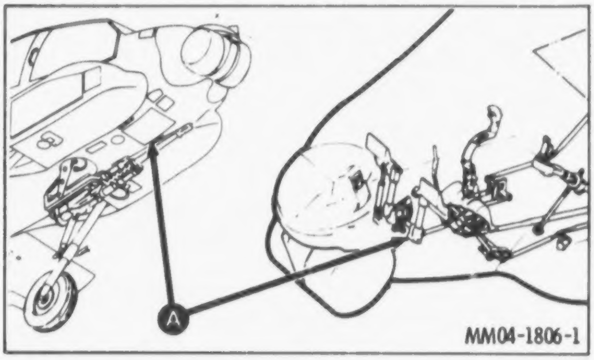
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

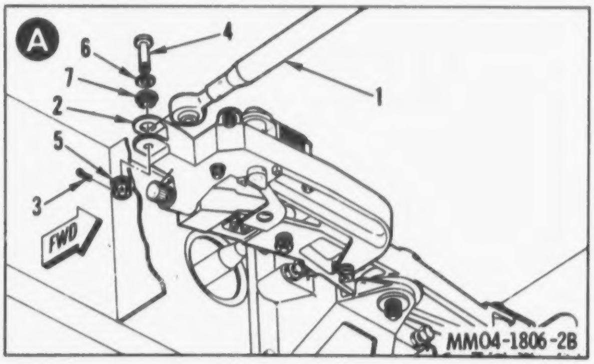
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels B60, B65L, and fairing L60 removed



A. REMOVAL

1. **Disconnect directional push-pull rod (1) from arm (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4), washer (6), and bushing (7) (if required).



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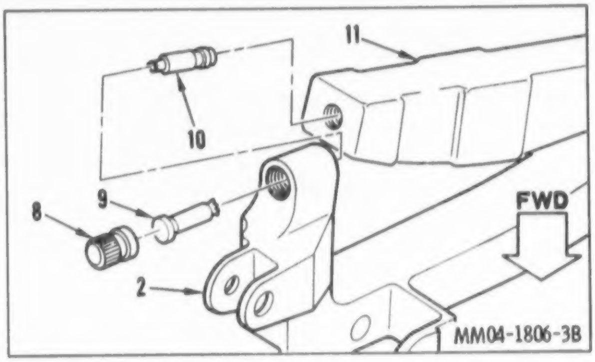
11-5-55. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-5-55



2. Remove shear pin retainer (8) from arm (2).

a. Remove lockwire.

b. Unscrew retainer (8).

NOTE

Shear pin must be removed in pieces if sheared.

3. Remove shear pin half (9) from arm (2).

4. Remove shear pin half (10) from SPAD (11).

a. Move arm (2) for access to shear pin half (10).

b. Remove shear pin half (10) from SPAD (11).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check SPAD, arm, and push-pull rod for damage and wear** (para 11-5-1).

2. **Check SPAD, arm, and push-pull rod for corrosion** (para 1-5-38).

3. **Check retainer for damaged threads.** None allowed.

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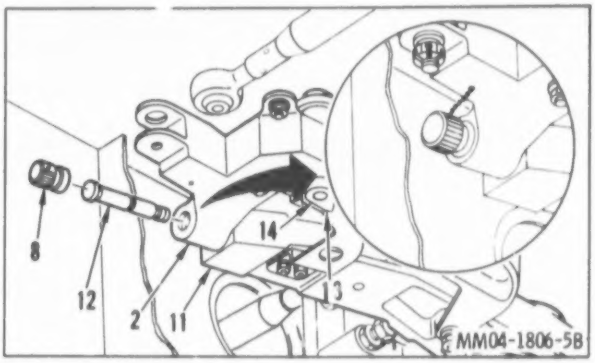
11-5-55. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-5-55

D. INSTALLATION



1. **Lubricate tapered end of shear pin (12). Use petrolatum (E16).**

2. **Install shear pin (12) in arm (2) and SPAD (11).**

   a. Aline arm (2) with SPAD (11).

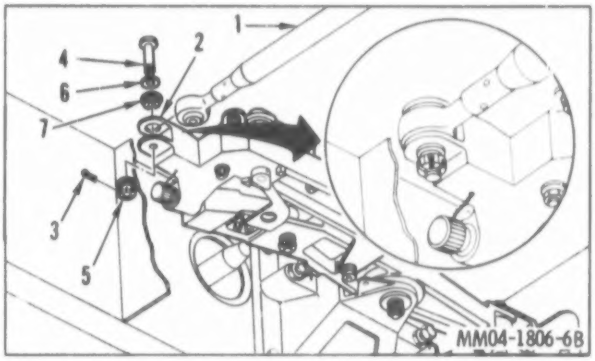
   b. Ensure that switch detent (13) and switch position lever (14) are engaged.

   c. Insert shear pin (12) through arm (2) and SPAD (11).

NOTE

Install retainer only fingertight.

3. **Install retainer (8) on arm (2).** Lockwire retainer (8) to arm (2). Use lockwire (E34).



4. **Connect directional push-pull rod (1) to arm (2).**

   a. Aline rod (1) to arm (2).

   b. Install bushing (7) (if required) in arm (2).

   c. Insert bolt (4) through bushing (7) (if required), washer (6), arm (2), and rod (1).

   d. Hold bolt (4). Install nut (5).

   e. Install new cotter pin (3).

5. **Inspect (TI).**

6. **Perform flight control system operational check** (TM 55-1520-238-T).

7. **Secure access panels B60 and B65L** (para 2-2-2).

8. **Install fairing L60** (para 2-2-3).

END OF TASK

11-5-56. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET - REPLACEMENT 11-5-56

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Airframe Repairer's	5180-00-323-4876

References:

TM 55-1500-204-25/1

Materials/Parts:

Bolt	MS27576-4-23 (use for alinement)
Bushing	HS610SP3756R250Y0406M (use for alinement)
Bushing	HS610SP3756R250Y0150M (use for alinement)
Nut	MS21224-4 (use for alinement)

Personnel Required:

68G10 Aircraft Structural Repairer
66R30 Inspector/Supervisor

A. REMOVAL

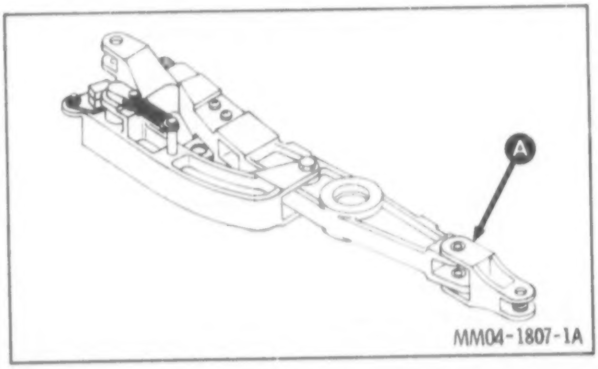
1. Remove shear rivet half (1) from transducer arm (2).
2. Remove rivet half (3) from SPAD (4).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check arm and SPAD for damage and wear (para 11-5-1).
2. Check arm and SPAD for corrosion (para 1-5-38).



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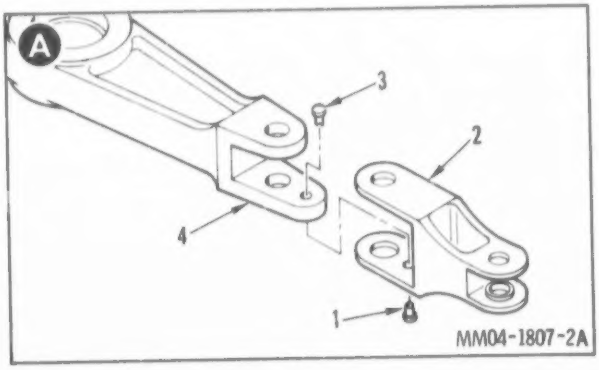

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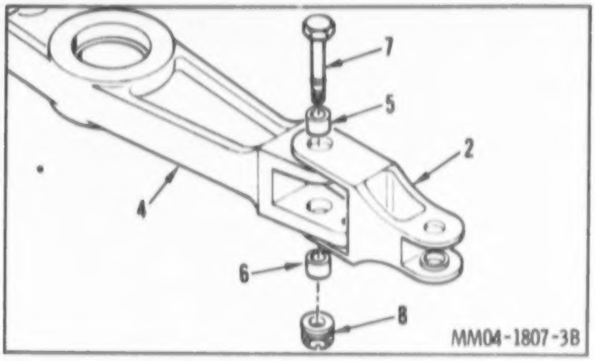
11-5-56. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (cont) 11-5-56

D. INSTALLATION



NOTE

Bolt, bushings, and nut are used to aline transducer arm and SPAD for installation of rivet.

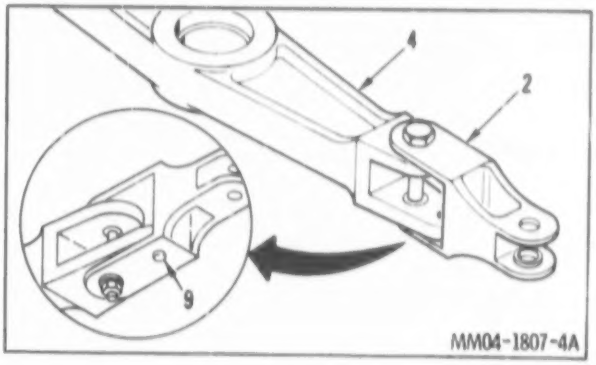
1. **Install transducer arm (2) on SPAD (4).**

   a. Aline transducer arm (2) with SPAD (4).

   b. Install bushings (5) and (6) in transducer arm (2).

   c. Insert alinement bolt (7) through transducer arm (2) and SPAD (4).

   d. Install nut (8). Tighten only until nut (8) contacts bushing (6).



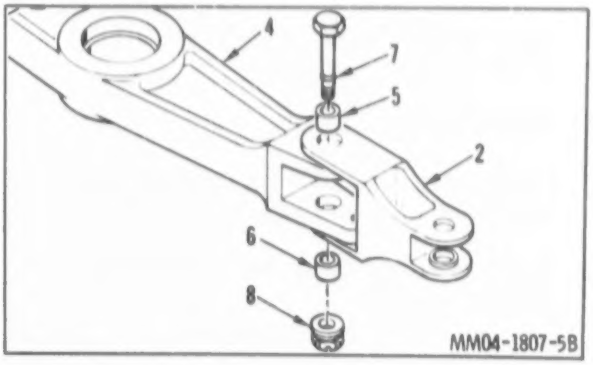
2. **Install transducer arm shear rivet (9).**

   a. Aline transducer arm (2) with SPAD (4).

   b. Insert rivet (9) through transducer arm (2) and SPAD (4).

   c. Install rivet (9) (TM 55-1500-204-25/1).

3. **Inspect (TI).**



4. **Remove bolt (7), bushings (5) and (6), and nut (8) from SPAD (4) and arm (2).**

END OF TASK

11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL 11-5-57

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit Control System	1730-00-240-1577

Equipment Conditions:

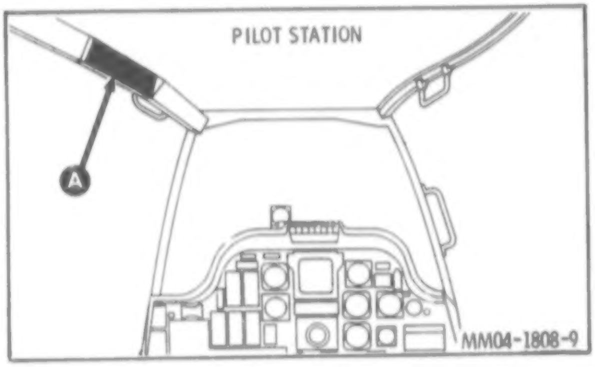
Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel B60, L200 removed
TM 9-1090-208-23	Gun turret removed

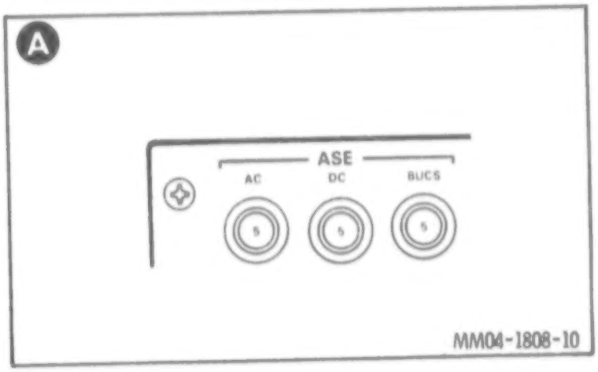
Personnel Required:

67R10 Attack Helicopter Repairer

A. REMOVAL

1. Enter pilot station (para 1-7-1). Observe all safety precautions.
2. Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.





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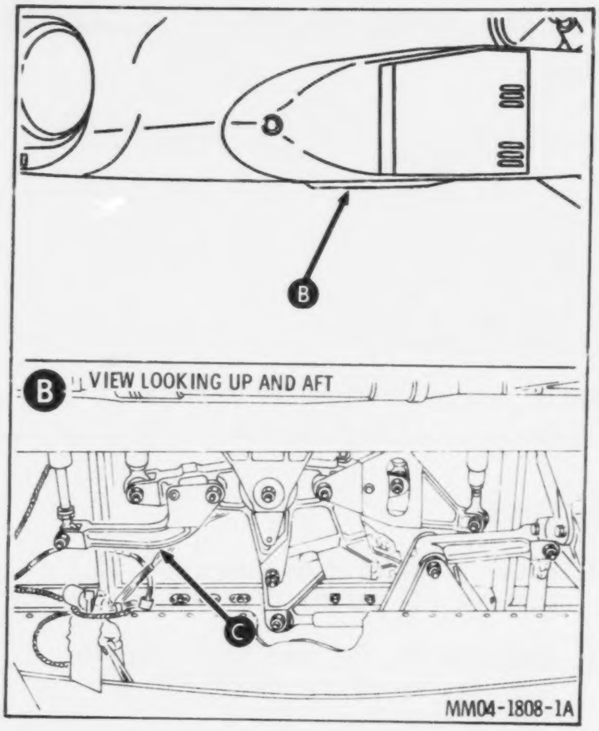
11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont) 11-5-57

3. Locate SPAD through gun turret bay.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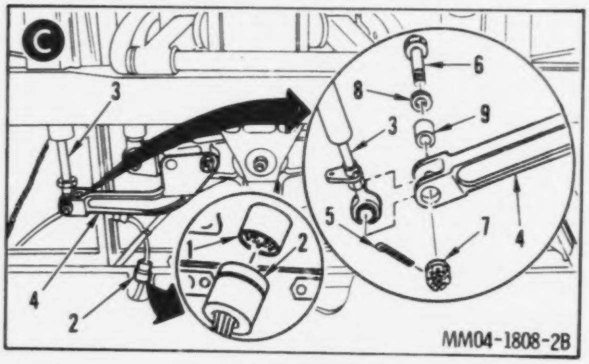
4. Detach connector (1) from connector (2).

5. Disconnect position transducer (3) from SPAD (4).

   a. Remove and discard cotter pin (5).

   b. Hold bolt (6). Remove nut (7).

   c. Remove bolt (6), washer (8), and bushing (9).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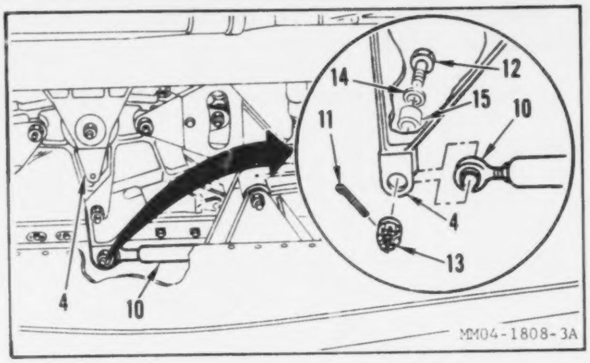
11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont) 11-5-57

6. **Disconnect directional push-pull rod (10) from SPAD (4).**

   a. Remove and discard cotter pin (11).

   b. Hold bolt (12). Remove nut (13).

   c. Remove bolt (12), washer (14), and bushing (15).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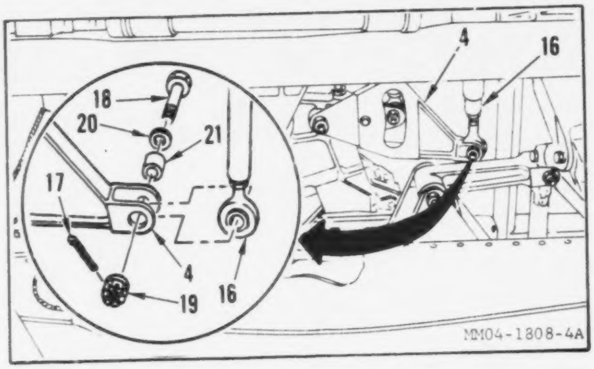
7. **Disconnect feel spring cartridge (16) from SPAD (4).**

   a. Remove and discard cotter pin (17).

   b. Hold bolt (18). Remove nut (19).

   c. Remove bolt (18), washer (20), and bushing (21).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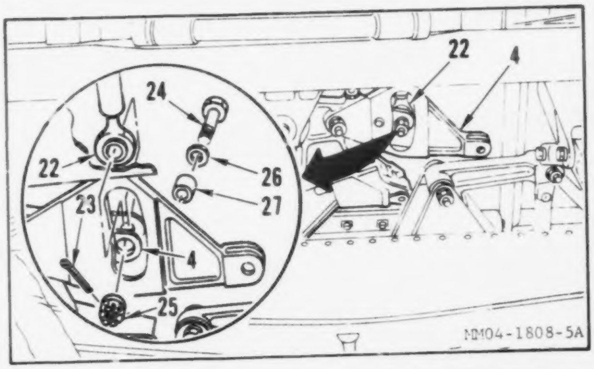
8. **Disconnect directional push-pull rod (22) from SPAD (4).**

   a. Remove and discard cotter pin (23).

   b. Hold bolt (24). Remove nut (25).

   c. Remove bolt (24), washer (26), and bushing (27).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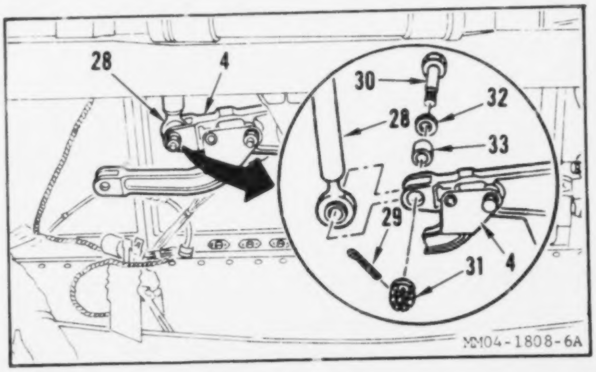
9. **Disconnect directional push-pull rod (28) from SPAD (4).**

   a. Remove and discard cotter pin (29).

   b. Hold bolt (30). Remove nut (31).

   c. Remove bolt (30), washer (32), and bushing (33).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11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont) 11-5-57

10. **Remove SPAD (4) from mounting bracket (34).**

    a. Remove and discard cotter pin (35).

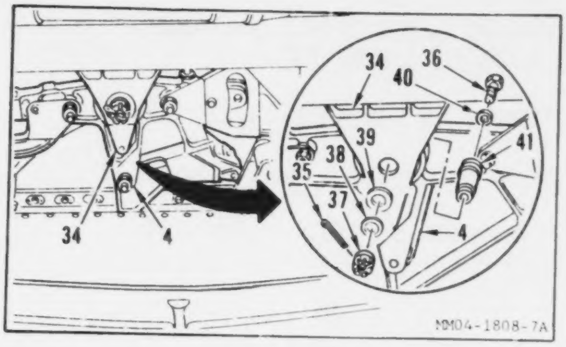
    b. Hold bolt (36). Remove nut (37), washer (38), and retainer (39).

    c. Remove bolt (36) and washer (40) from shaft (41).

    d. Remove shaft (41) from SPAD (4).

    e. Remove SPAD (4) from bracket (34).

    f. Remove bearing (42) and bushing (43) from SPAD (4).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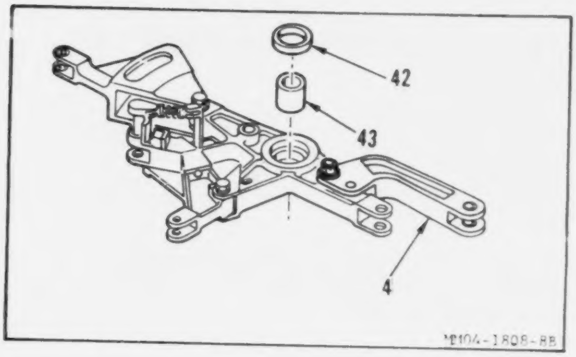
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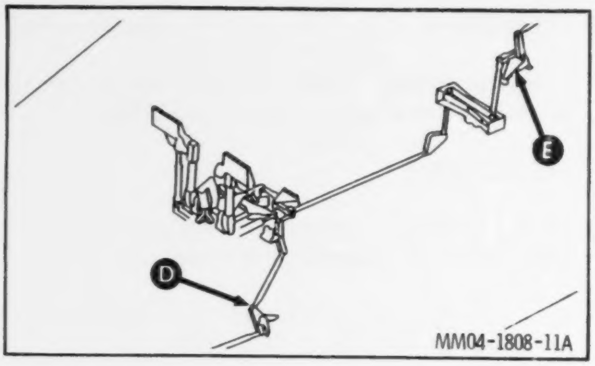
11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont) 11-5-57

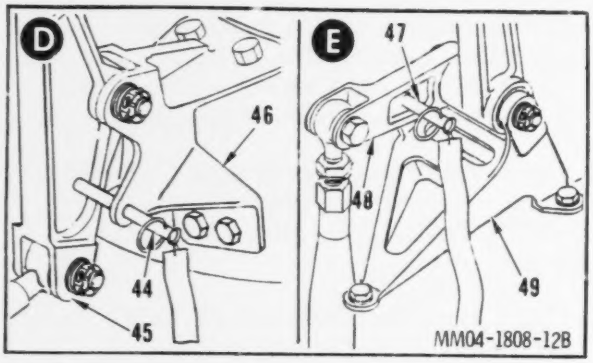
11. **Place directional flight controls in neutral position.**

CAUTION

To prevent damage to flight control components, DO NOT FORCE bellcranks into alinement with brackets or push-pull rods with bellcranks.

12. **Install rigging pin -9 (44) through directional FS 110 bellcrank (45) and bracket (46).** Use control systems rigging kit.
    a. Locate bellcrank (45) and bracket (46) in gun turret bay.
    b. Install rigging pin -9 (44) through bellcrank (45) and bracket (46).
13. **Install rigging pin -9 (47) through directional FS 164 bellcrank (48) and bracket (49).**
    a. Locate bellcrank (48) and bracket (49) on main deck.
    b. Install rigging pin -9 (47) through bellcrank (48) and bracket (49).





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11-5-57. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL (cont)

B. CLEANING

Clean bracket, SPAD, shaft, and push-pull rod ends (para 1-5-36).

C. INSPECTION

1. Check bracket, push-pull rods, shaft, and SPAD for damage and wear.

   a. Push-pull control rod straightness must be within 0.003 inch.

   b. Any damage is not to exceed 0.010 inch or 10% of wall thickness, whichever is less in depth, and 1 inch in length.

2. Check bearings in push-pull rods for play. Maximum allowable limits: RADIAL PLAY 0.001 inch, AXIAL PLAY 0.009 inch.

3. Check bracket, SPAD, shaft, and push-pull rods for corrosion (para 1-5-38).

END OF TASK

11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION 11-5-58

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit Control System	1730-01-240-1577
Wrench, Torque, 1/4 Drive	5120-00-117-4832

Materials/Parts:

Cotter Pin (6)

Personnel Required:

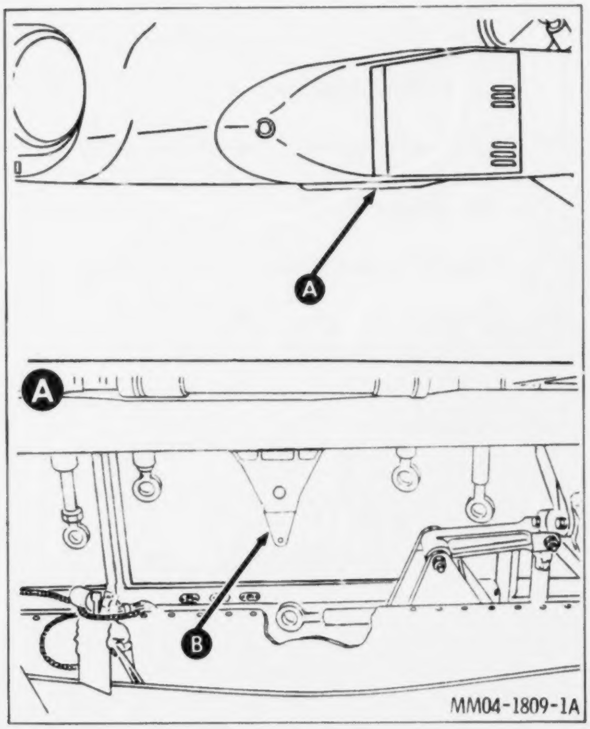
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed



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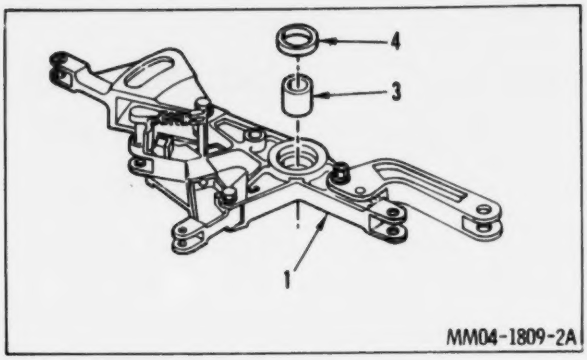
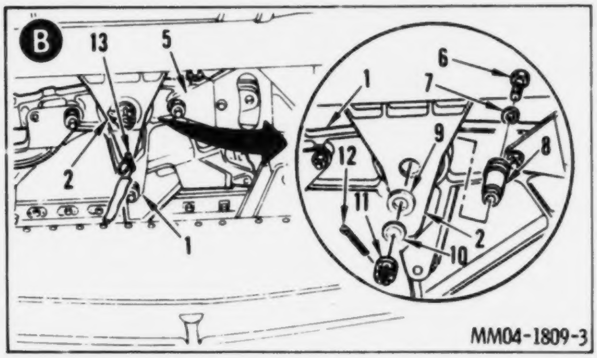
11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-58

1. **Install SPAD (1) in mounting bracket (2).** Torque nut (11) **30 to 40 INCH-POUNDS.**
   a. Install bushing (3) and bearing (4) in SPAD (1).
   b. Position SPAD (1) on bracket (2) with arm (5) to left side of aircraft.
   c. Insert bolt (6) through washer (7) into shaft (8).
   d. Insert shaft (8) with bolt (6) and washer (7) through mounting bracket (2) and SPAD (1).
   e. Hold bolt (6). Install retainer (9), washer (10), and nut (11).
   f. Torque nut (11) to **30 INCH-POUNDS.**
   g. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**
   h. Install new cotter pin (12).
   i. Install rigging pin -9 (13) through bracket (2) and SPAD (1).





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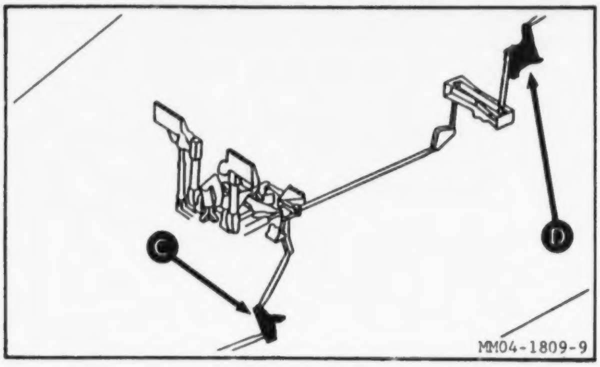
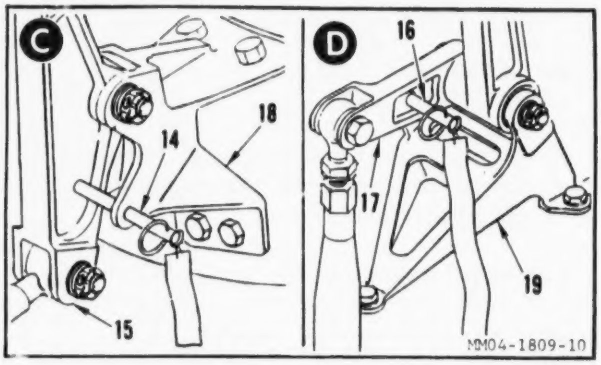
11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-58





NOTE

Go to step 5 if rigging pins are installed in FS 110 and FS 164 directional bellcranks.

2. **Place directional flight controls in neutral position.**

CAUTION

To prevent damage to flight control components, **DO NOT FORCE** bellcranks into alinement with brackets or push-pull rods with bellcranks.

3. **Install rigging pin -9 (14) through directional FS 110 bellcrank (15) and bracket (18).** Use control systems rigging kit.
   a. Locate bellcrank (15) and bracket (18) in gun turret bay.
   b. Install rigging pin -9 (14) through bellcrank (15) and bracket (18).
4. **Install rigging pin -9 (16) through directional FS 164 bellcrank (17) and bracket (19).**
   a. Locate bellcrank (17) and bracket (19) on main deck.
   b. Install rigging pin -9 (16) through bellcrank (17) and bracket (19).

GO TO NEXT PAGE

11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-58

5. **Connect directional push-pull rod (20) to SPAD (1). Torque nut (24) 30 to 40 INCH-POUNDS.**

   a. Aline rod (20) with PAD (1).

   b. Install bushing (21) in SPAD (1).

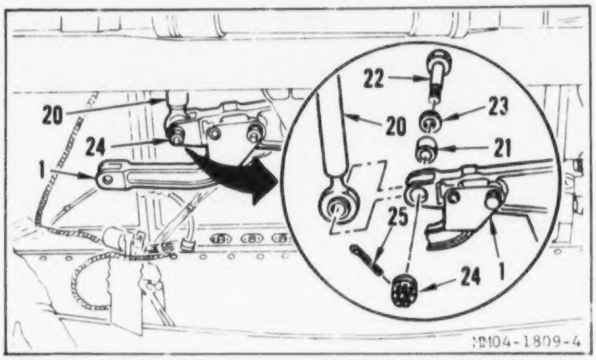
   c. Insert bolt (22) through washer (23), bushing (21), SPAD (1), and rod (20).

   d. Hold bolt (22). Install nut (24).

   e. Torque nut (24) to **30 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   g. Install new cotter pin (25).



6. **Connect directional push-pull rod (26) to SPAD (1). Torque nut (30) to 30 to 40 INCH-POUNDS.**

   a. Aline rod (26) with SPAD (1).

   b. Install bushing (27) in SPAD (1).

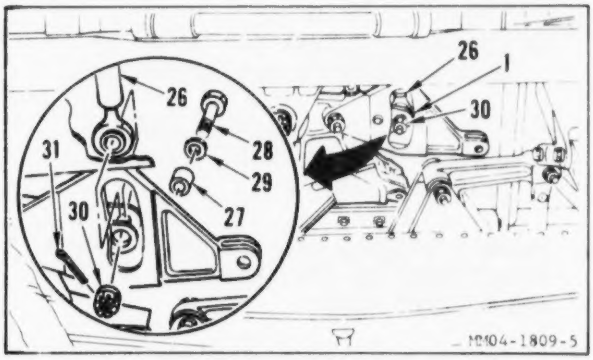
   c. Insert bolt (28) through washer (29), bushing (27), SPAD (1), and rod (26).

   d. Hold bolt (28). Install nut (30).

   e. Torque nut (30) to **30 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   g. Install new cotter pin (31).



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11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-58

7. **Connect feel spring cartridge (32) to SPAD (1).** Torque nut (36) **30 to 40 INCH-POUNDS.**

   a. Aline cartridge (32) with SPAD (1).

   b. Install bushing (33) in SPAD (1).

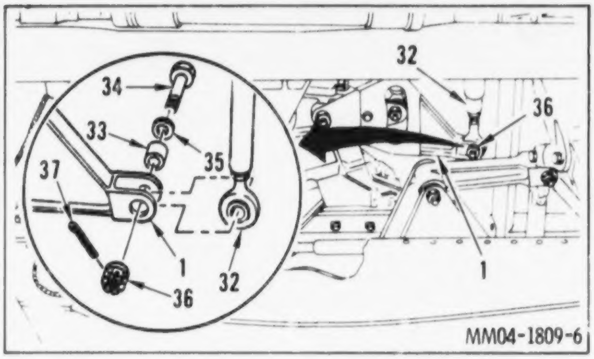
   c. Insert bolt (34) through washer (35), bushing (33), SPAD (1), cartridge (32).

   d. Hold bolt (34). Install nut (36).

   e. Torque nut (36) to **30 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   g. Install new cotter pin (37).



8. **Connect position transducer (44) to SPAD (1).** Torque nut (48) **14 to 18 INCH-POUNDS.**

   a. Aline transucer (44) with SPAD (1).

   b. Install bushing (45) in SPAD (1).

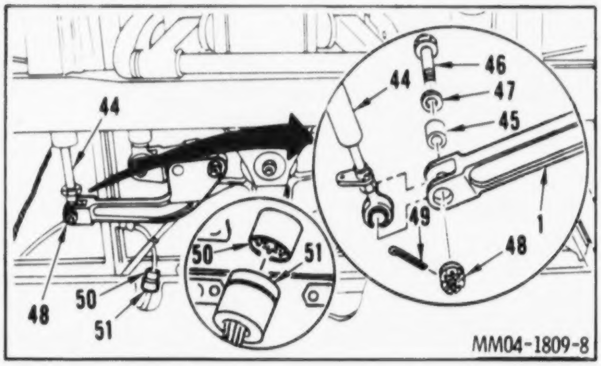
   c. Insert bolt (46) through washer (47), bushing (45), SPAD (1), and transducer (44).

   d. Hold bolt (46). Install nut (48).

   e. Torque nut (48) to **14 INCH-POUNDS.**

   f. Increase torque to aline cotter pin holes, but do not exceed **18 INCH-POUNDS.**

   g. Install new cotter pin (49).



9. **Attach connector J231 (50) to connector P231 (51).**

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11-5-58. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION (cont) 11-5-58

10. **Connect directional push-pull rod (38) to SPAD (1).** Torque nut (42) to 30 to 40 **INCH-POUNDS.**

    a. Aline rod (38) with SPAD (1).

    b. Install bushing (39) in SPAD (1).

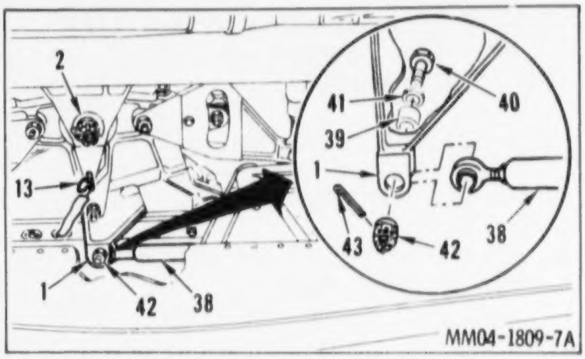
    c. Insert bolt (40) through washer (41), bushing (39), SPAD (1), and rod (38).

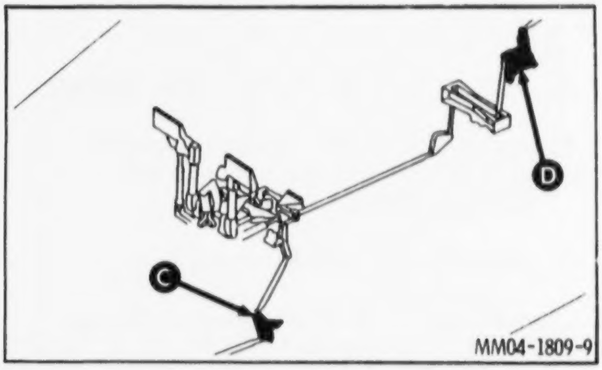
    d. Hold bolt (40). Install nut (42).

    e. Torque nut (42) to **30 INCH-POUNDS.**

    f. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

    g. Install new cotter pin (43).



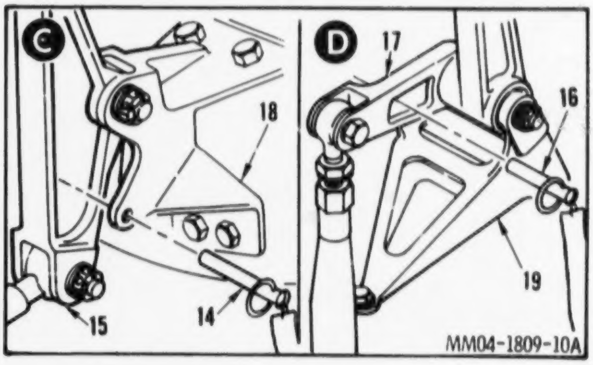


11. **Remove rigging pins -9 (13), -9 (14), and -9 (16).**

    a. Remove rigging pin -9 (13) from SPAD (1) and bracket (2).

    b. Remove rigging pin -9 (14) from FS 110 bellcrank (15) and bracket (18).

    c. Remove rigging pin -9 (16) from FS 164 bellcrank (17) and bracket (19).



12. **Inspect (TI).**

13. **Install gun turret** (TM 9-1090-208-23).

14. **Install gun** (TM 9-1090-208-23).

15. **Secure access panel B60, L200** (para 2-2-2).

END OF TASK

11-5-59. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT 11-5-59

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

	Cotter Pin
	Shear Pin
(E17)	Petrolatum
(E34)	Lockwire

Personnel Required:

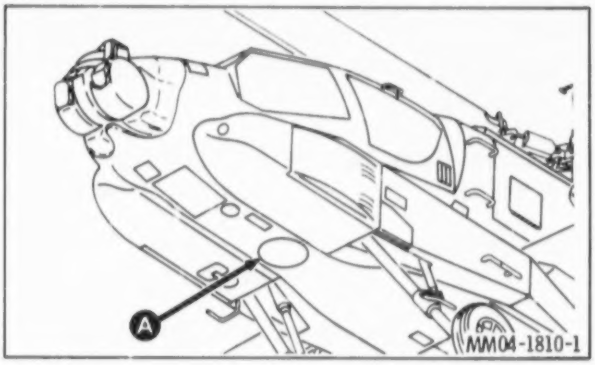
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

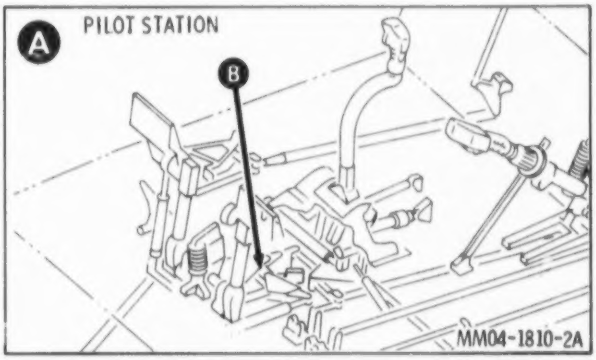
References:

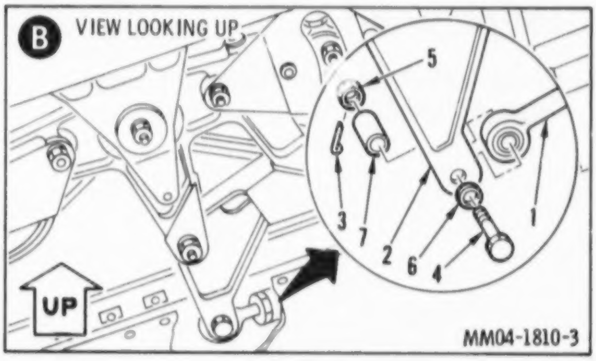
TM 55-1520-238-T
TM 9- 1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	30mm gun removed Gun turret removed







A. REMOVAL

1. **Disconnect directional push-pull rod (1) from arm (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), (if required), and bushing (7).

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11-5-59. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-5-59

2. **Remove shear pin retainer (8) from SPAD (9).**

   a. Remove lockwire.

   b. Unscrew retainer (8).

NOTE

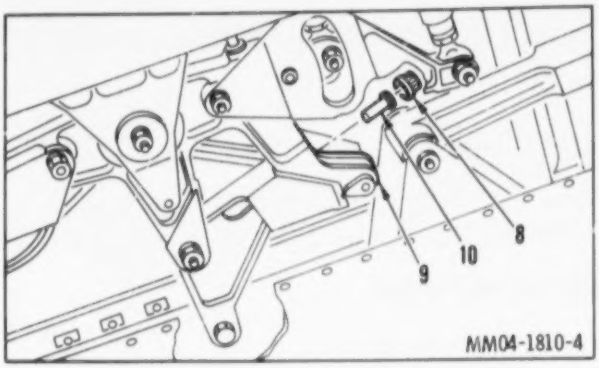
Shear pin will be removed in pieces if sheared.

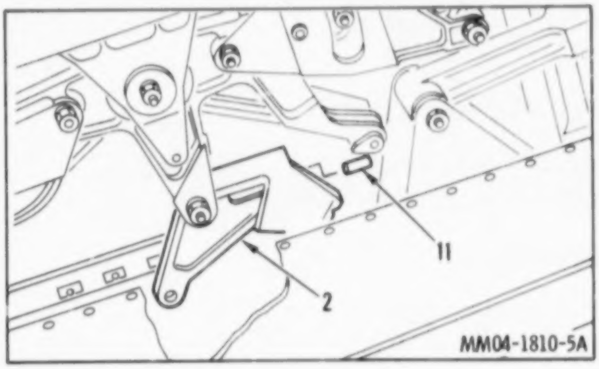
3. **Remove shear pin half (10) from SPAD (9).**

4. **Remove shear pin half (11) from arm (2).**

   a. Move arm (2) for access to shear pin half (11).

   b. Remove shear pin half (11) from arm (2).





B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check SPAD push-pull rod for damage and wear** (para 11-5-1).

2. **Check SPAD retainer, and push-pull rod for corrosion (para 1-5-38).**

3. **Check retainer for damaged threads.** None allowed.

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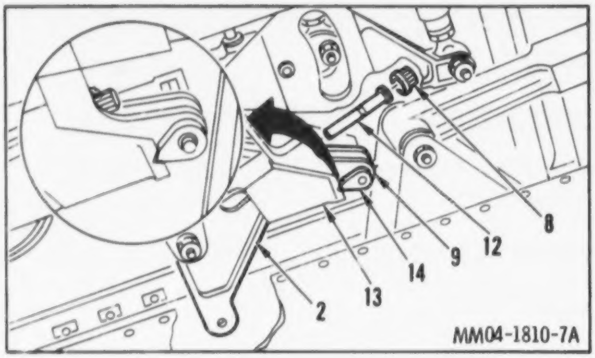
11-5-59. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT (cont) 11-5-59

D. INSTALLATION



1. **Lubricate tapered end of shear pin (12).** Use petrolatum (E17).

2. **Install shear pin (12) in SPAD (9) and arm (2).**

   a. Aline arm (2) with SPAD (9).

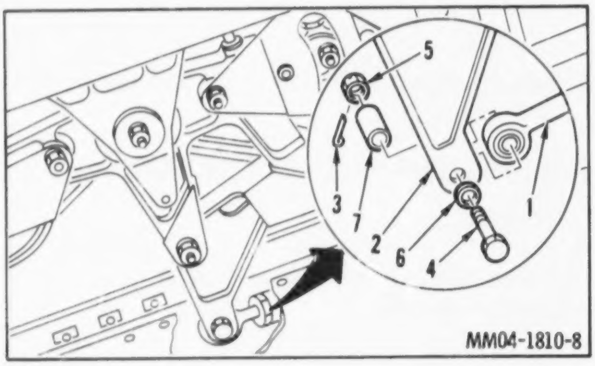
   b. Ensure that switch detent (13) and switch position lever (14) are engaged.

   c. Insert shear pin (12) through arm (2) and SPAD (9).

NOTE

Install retainer only fingertight.

3. **Install retainer (8) on SPAD (9).** Lockwire retainer (8) to arm (2). Use lockwire (E34).



4. **Connect directional push-pull rod (1) to arm (2).**

   a. Aline rod (1) with arm (2).

   b. Install bushing (7) in arm (2).

   c. Insert bolt (4) through bushing (7), washer (6) (if required), arm (2), and rod (1).

   d. Hold bolt (4). Install nut (5).

   e. Install new cotter pin (3).

5. **Inspect (TI).**

6. **Perform flight control system operational check** (TM 55-1520-238-T).

7. **Install gun turret and 30mm aircraft gun** (TM 9-1090-280-23).

END OF TASK

11-5-60. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) TRANSDUCER ARM SHEAR RIVET REPLACEMENT 11-5-60

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Airframe Repairer's	5180-00-323-4876

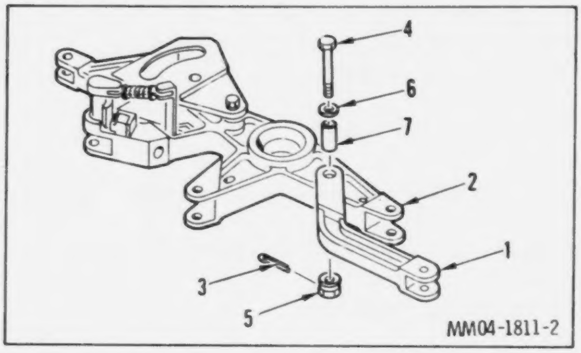
Personnel Required:

68G10	Aircraft Structural Repairer
66R30	Inspector/Supervisor

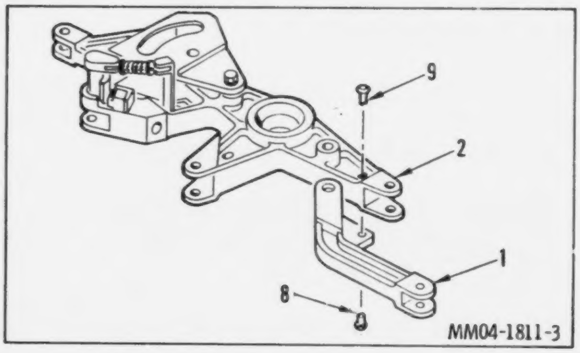
Materials/Parts:

Cotter Pin

A. REMOVAL



1. **Remove transducer arm (1) from SPAD (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4). Remove nut (5).
   c. Remove bolt (4), washer (6), and bushing (7).
   d. Remove arm (1) from SPAD (2).



2. **Remove rivet half (8) from transducer arm (1).**
3. **Remove rivet half (9) from SPAD (2).**

B. CLEANING

Clean transducer arm and SPAD (para 1-5-36).

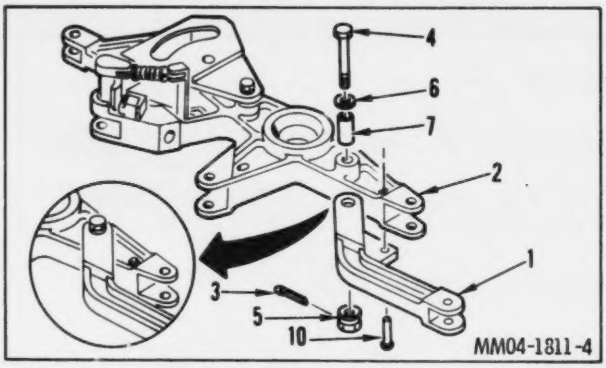
C. INSPECTION

1. **Check transducer arm and SPAD for damage and wear** (para 11-5-1).
2. **Check transducer arm and SPAD for corrosion** (para 1-5-38).

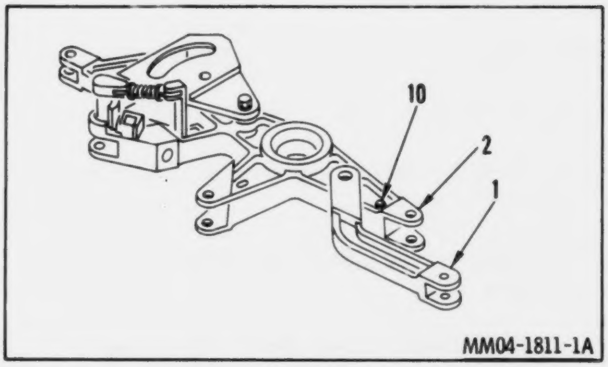
GO TO NEXT PAGE

11-5-60. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) TRANSDUCER ARM SHEAR RIVET REPLACEMENT (cont) 11-5-60

D. INSTALLATION



1. **Install transducer arm (1) on SPAD (2).**
   - a. Aline transducer arm (1) with SPAD (2).
   - b. Install bushing (7) in transducer arm (1).
   - c. Insert bolt (4) through bushing (7), washer (6), transducer arm (1), and SPAD (2).
   - d. Hold bolt (4). Install nut (5).
   - e. Install new cotter pin (3).



2. **Install shear rivet (10) in SPAD (2) and transducer arm (1).**
   - a. Insert rivet (10) through transducer arm (1) and SPAD (2).
   - b. Install rivet (10).
3. **Inspect (TI).**

END OF TASK

11-5-61. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT 11-5-61

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Airframe Repairer	5180-00-323-4876

Materials/Parts:

Cotter Pin	
Rivet	MS 20470AD3

Personnel Required:

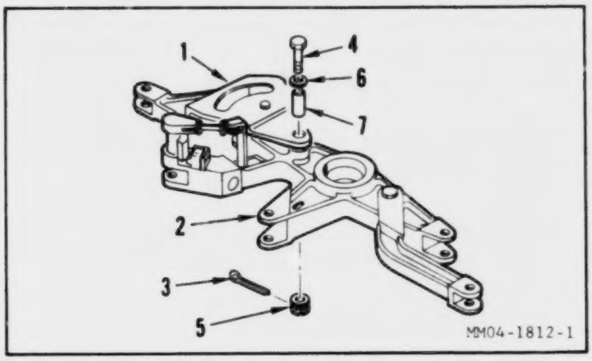
68G10	Aircraft Structural Repairer
66R30	Inspector/Supervisor

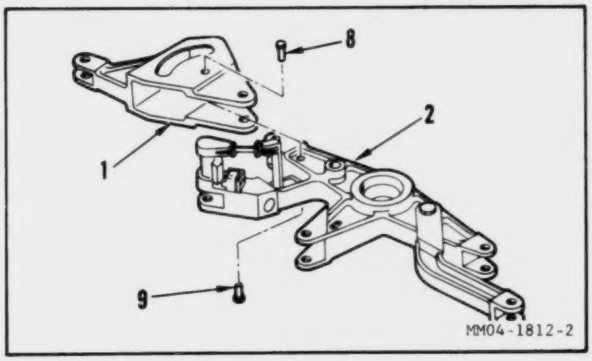
References:

TM 55-1500-204-25/1

A. REMOVAL

1. **Remove feel spring cartridge arm (1) from SPAD (2).**
   - a. Remove and discard cotter pin (3).
   - b. Hold bolt (4). Remove nut (5).
   - c. Remove bolt (4), washer (6), and bushing (7).
   - d. Remove feel spring cartridge arm (1).
2. **Remove shear rivet half (8) from SPAD (2).**
3. **Remove rivet half (9) from SPAD (2).**





B. CLEANING

Clean cartridge arm and SPAD (para 1-5-36).

C. INSPECTION

1. **Check cartridge arm and SPAD for damage and wear** (para 11-5-1).
2. **Check cartridge arm and SPAD for corrosion** (para 1-5-38).

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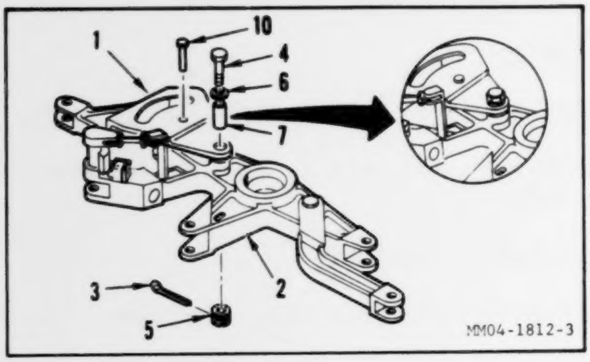
11-5-61. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (cont) 11-5-61

D. INSTALLATION



1. **Install feel spring cartridge arm (1) on SPAD (2).**
   a. Aline arm (1) with SPAD (2).
   b. Install bushing (7) in arm (1).
   c. Insert bolt (4) through washer (6), arm (1) and SPAD (2).
   d. Install nut (5).
   e. Install new cotter pin (3).
2. **Install shear rivet (10) in arm (1).**
   a. Aline arm (1) with SPAD (2).
   b. Install rivet (10) (TM 55-1500-204-25/1).
3. **Inspect (TI).**

11-5-62. PILOT DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL 11-5-62

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	30mm gun removed
TM 9-1090-208-23	Gun turret removed

A. REMOVAL

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**

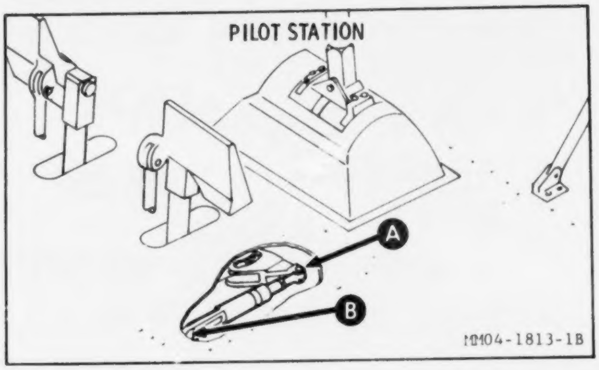
2. **Open ASE AC, DC, and BUCS circuit breakers on pilot center circuit breaker panel.**

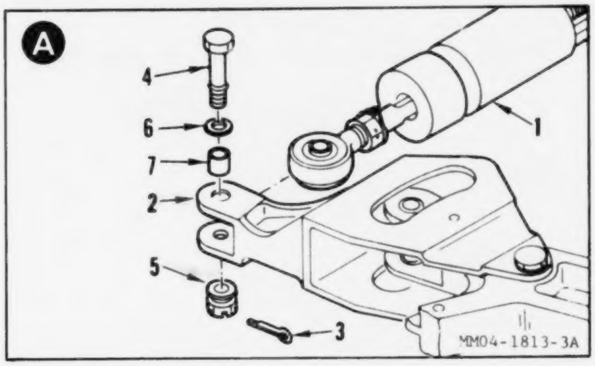
3. **Disconnect directional feel spring cartridge (1) from pilot shear pin activated decoupler (SPAD) (2).**

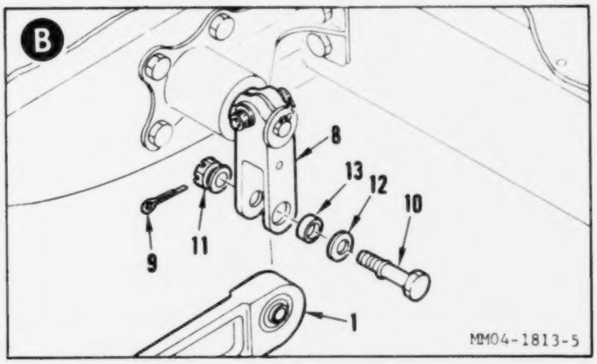
   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), and bushing (7).







4. **Disconnect feel spring cartridge (1) from magnetic brake arm (8).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10), washer (12), and bushing (13).

GO TO NEXT PAGE

11-5-62. PILOT DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL (cont) 11-5-62

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check cartridge and SPAD for damage and wear (para 11-5-1).
2. Check cartridge and SPAD for corrosion (para 1-5-38).

END OF TASK

11-5-63. PILOT DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION 11-5-63

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692

Materials/Parts:

Cotter Pin (2)

Personnel Required:

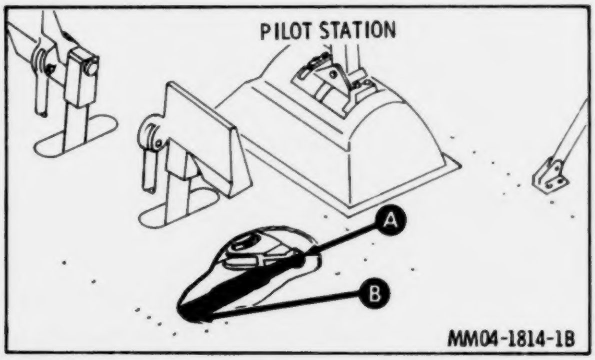
67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

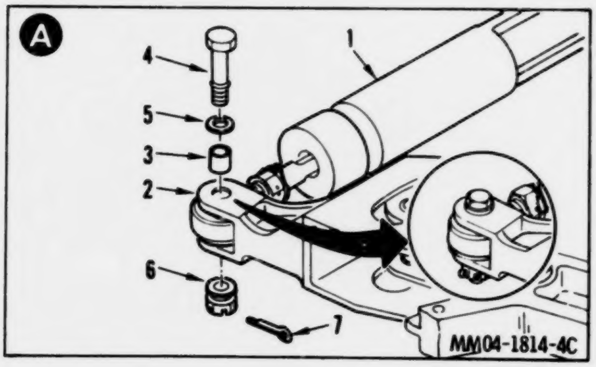
References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed





1. **Connect directional feel spring cartridge (1) to pilot shear pin activated decoupler (SPAD) (2).**

   a. Aline cartridge (1) with SPAD (2).

   b. Install bushing (3) in SPAD (2).

   c. Insert bolt (4), through bushing (3), washer (5), SPAD (2) and cartridge (1).

   d. Hold bolt (4). Install nut (6).

   e. Install new cotter pin (7).

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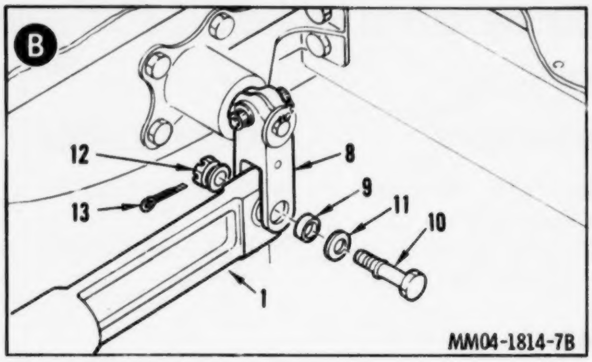
11-5-63. PILOT DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION (cont) 11-5-63



2. **Connect feel spring cartridge (1) to magnetic brake arm (8).**
   a. Aline cartridge (1) with arm (8).
   b. Install bushing (9) in arm (8).
   c. Insert bolt (10) through bushing (9), washer (11), arm (8), and cartridge (1).
   d. Hold bolt (10). Install nut (12).
   e. Install new cotter pin (13).
3. **Inspect (TI).**
4. **Perform flight control system operational check** (TM 55-1520-238-T).
5. **Install 30mm gun** (TM 9-1090-208-23).
6. **Install gun turret** (TM 9-1090-208-23).

END OF TASK

11-5-64. DIRECTIONAL FS 164 BELLCRANK REMOVAL/INSTALLATION 11-5-64

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 1/4 Drive	5120-00-542-4489

Materials/Parts:

Cotter Pin (3)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panel L200 removed
9-5-5	Transformer rectifier No. 1 removed
TM 9-1090-208-23	Gun and turret removed

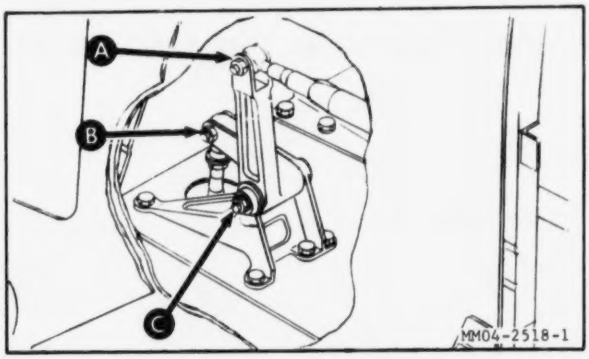
A. REMOVAL

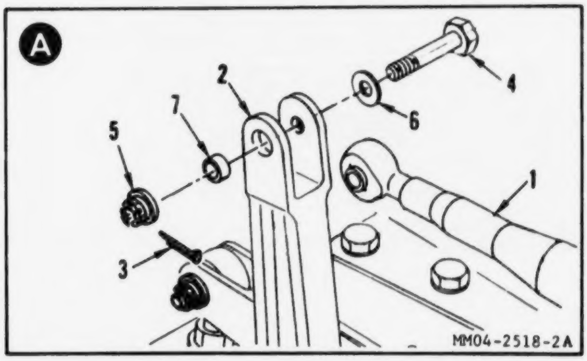
1. **Disconnect directional FS 164 push-pull rod (1) from directional FS 164 bellcrank (2).**

   a. Remove and discard cotter pin (3).

   b. Hold bolt (4). Remove nut (5).

   c. Remove bolt (4), washer (6), bushing (7), and rod (1) from bellcrank (2).





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11-5-64. DIRECTIONAL FS 164 BELLCRANK REMOVAL/INSTALLATION (cont) 11-5-64

2. **Secure rod (8) to prevent interference with bellcrank (2) during movement of controls.**

3. **Disconnect directional FS 160 push-pull rod (8) from FS 164 bellcrank (2).**

   a. Remove and discard cotter pin (9).

   b. Hold bolt (10). Remove nut (11).

   c. Remove bolt (10), washer (12), bushing (13), and rod (8) from bellcrank (2).

4. **Secure rod (8) to prevent interference with bellcrank (2) during movement of controls.**

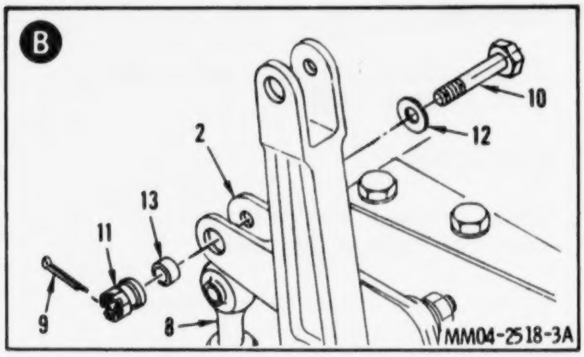
5. **Remove FS 164 bellcrank (2) from directional FS 164 bracket (14).**

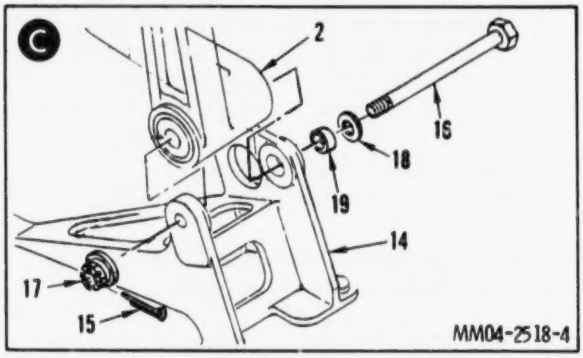
   a. Remove and discard cotter pin (15).

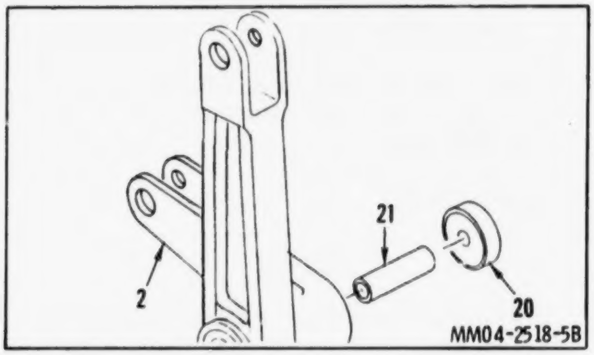
   b. Hold bolt (16). Remove nut (17).

   c. Remove bolt (16) and washer (18) from bellcrank (2) and bracket (14). Remove bellcrank (2) and bushing (19) from bracket (14).

6. **If replacing bellcrank, remove floating bearing (20), and bushing (21) from bellcrank (2).**







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B. CLEANING

Wipe bracket and push-pull rods with a clean rag.

C. INSPECTION

1. **Check bracket and push-pull rods for damage and wear.**

   a. Push-pull control rod bends must not exceed **0.030 inch.**

   b. Damage length is not to exceed 1 inch; depth is not to exceed 0.010 inch or 10 percent of wall thickness, whichever is less.

2. **Check bracket and push-pull rods for corrosion** (para 1-5-38).

3. **Check two push-pull rod ends for excessive bearing play.**

   a. Maximum allowable radial play in control rod end bearing - **0.001 inch.**

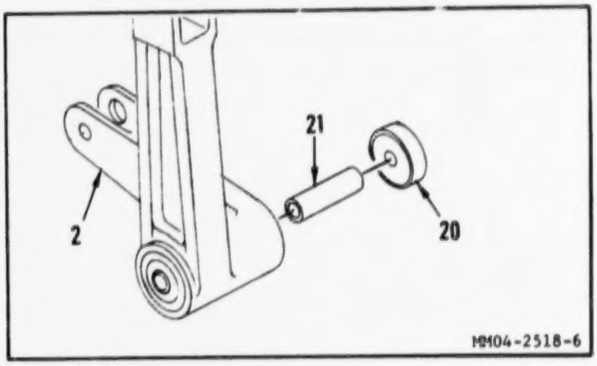
   b. Maximum allowable axial play in control rod end bearing - **0.009 inch.**

D. INSTALLATION

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcranks with brackets or push-pull rods with bellcranks.

1. **If installing new bellcrank, install internal bushing (21) and floating bearing (20) in directional FS 164 bellcrank (2).**



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11-5-64. DIRECTIONAL FS 164 BELLCRANK REMOVAL/INSTALLATION (cont) 11-5-64

2. **Install FS 164 bellcrank (2) in directional FS 164 bracket (14).** Torque nut (17) **30 to 40 INCH-POUNDS.**

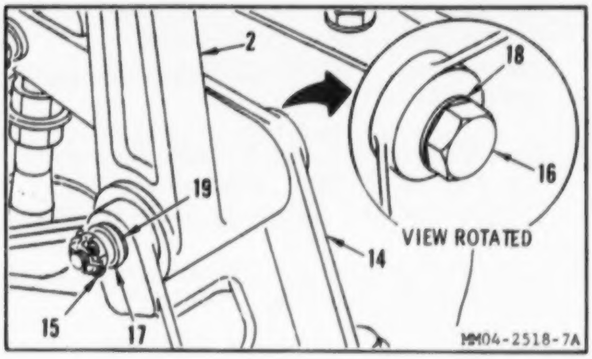
   a. Position bellcrank (2) in bracket (14). Aline bolt holes. Install bushing (19).

   b. Install bolt (16) through washer (18) bracket (14), and bellcrank (2) (para 11-2-1).

   c. Hold bolt (16). Install nut (17). Torque nut (17) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (15).



3. **Connect directional FS 160 push-pull rod (8) to FS 164 bellcrank (2).** Torque nut (11) **30 to 40 INCH-POUNDS.**

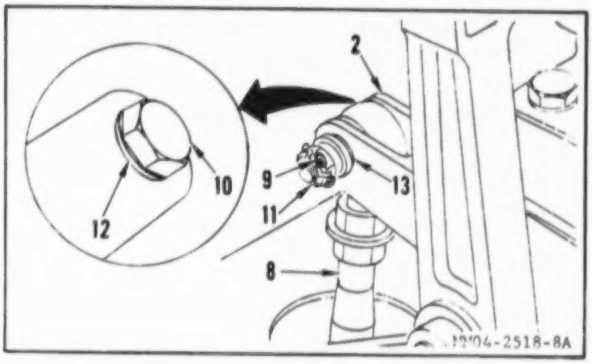
   a. Position rod (8) in bellcrank (2), aline bolt holes and install bushing (13).

   b. Install bolt (10) through washer (12) bellcrank (2) and rod (8) (para 11-2-1).

   c. Hold bolt (10). Install nut (11). Torque nut (11) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (9).



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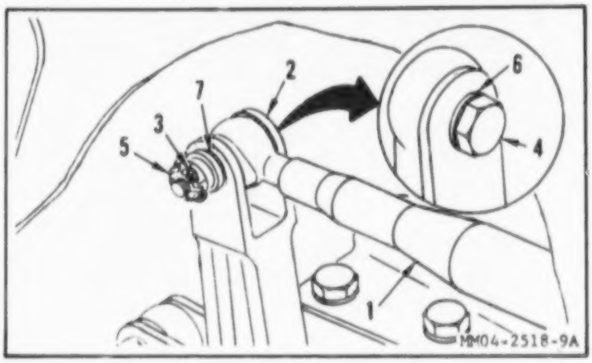
11-5-64. DIRECTIONAL FS 164 BELLCRANK REMOVAL/INSTALLATION (cont) 11-5-64

4. **Perform directional flight controls rig between pilot pedals and directional servocylinder** (para 11-6-15).



5. **Connect directional FS 164 push-pull rod (1) to FS 164 bellcrank (2).** Torque nut (5) **30 to 40 INCH-POUNDS.**

   a. Position rod (1) in bellcrank (2). Aline bolt holes. Install bushing (7).

   b. Install bolt (4) through washer (6), bellcrank (2) and rod (1) (para 11-2-1).

   c. Hold bolt (4). Install nut (5). Torque nut (5) to **30 INCH-POUNDS.**

   d. Increase torque to aline cotter pin holes, but do not exceed **40 INCH-POUNDS.**

   e. Install new cotter pin (3).

6. **Inspect (TI).**

7. **Install No. 1 transformer rectifier** (para 9-5-5).

8. **Install turret and gun** (TM 9-1090-208-23).

9. **Secure access panel L200** (para 2-2-2).

10. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

END OF TASK

11-5-65. CPG DIRECTIONAL CONTROL PEDAL REMOVAL 11-5-65

This task covers: A. REMOVAL B. CLEANING C. INSPECTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Handle, Hinged, 1/2 Drive	5120-00-221-7958
Socket, 1 inch, 1/2 Drive	5120-00-189-7927

Personnel Required:

67R10 Attack Helicopter Repairer

Equipment Conditions:

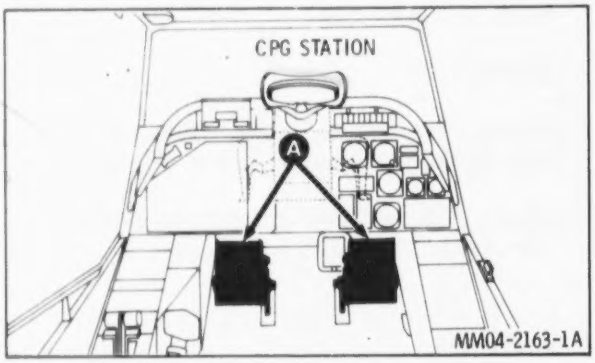
Ref	Condition
1-7-2	Helicopter safed

A. REMOVAL

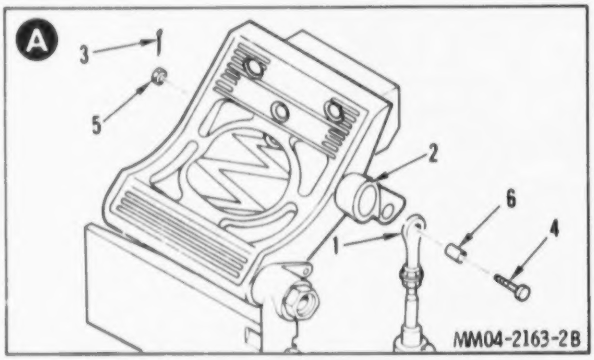
1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

NOTE

The following task is typical for left and right directional pedals.



2. **Remove rod end of master cylinder (1) from pedal clevis (2).**
   a. Remove and discard cotter pin (3).
   b. Hold bolt (4).
   c. Remove nut (5).
   d. Remove bolt (4) and bushing (6).



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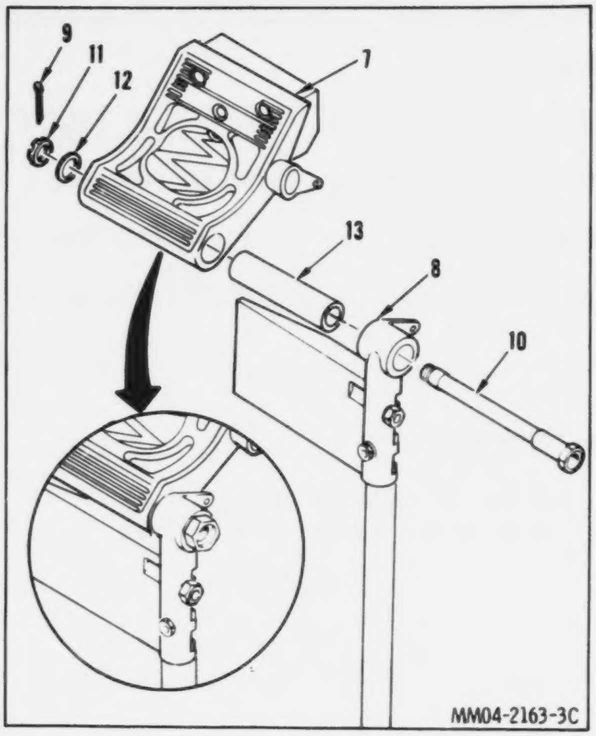


3. Remove pedal (7) from support (8).

a. Remove and discard cotter pin (9).

b. Hold bolt (10).

c. Remove nut (11), washer (12), spacer (13), and pedal (7).

d. Remove bolt (10).

B. CLEANING

Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. **Check removed and attaching parts for damage and wear** (para 11-5-1).
2. **Check removed and attaching parts for corrosion** (para 1-5-38).

END OF TASK

11-5-66. CPG DIRECTIONAL CONTROL PEDAL INSTALLATION 11-5-66

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-288-8865
Adapter, 3/8 Drive to 1/2	5120-00-240-8703
Socket, 1-inch, 1/2 Drive	5120-00-935-7453
Wrench, 15/16 & 1-inch Box	5120-00-204-2670

Materials/Parts:

Cotter Pins (2)

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

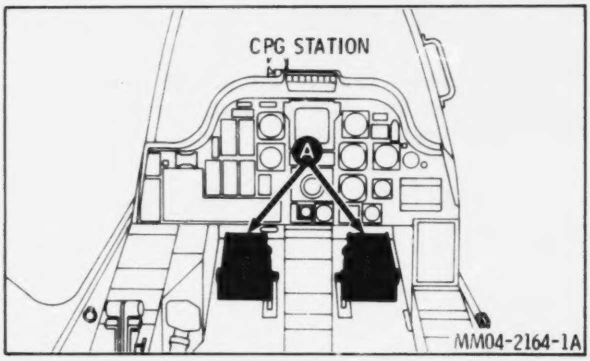
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

1. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**

NOTE

The following task is typical for left and right directional pedals.



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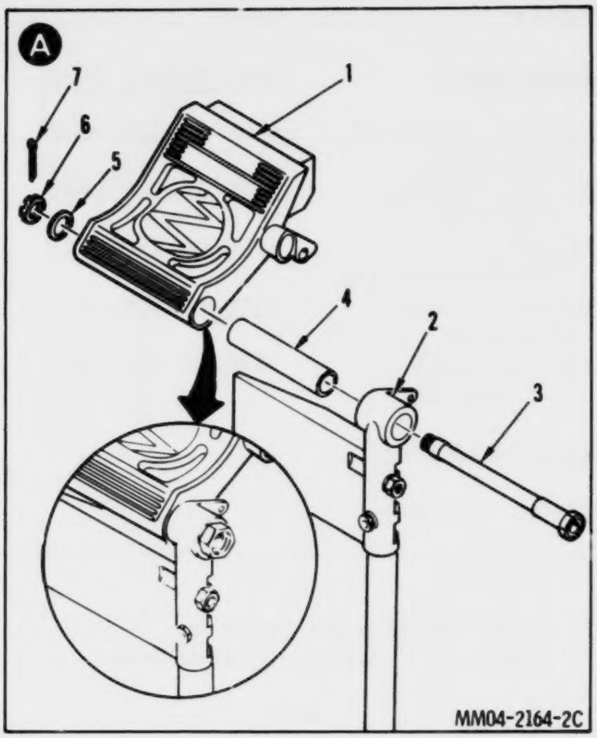
11-5-66. CPG DIRECTIONAL CONTROL PEDAL INSTALLATION (cont) 11-5-66

2. **Connect directional pedal (1) to support (2).**
   a. Insert bolt (3) through support (2) and spacer (4) from inboard side.
   b. Aline bolt (3) with hole in pedal (1).
   c. Slide pedal (1) on bolt until pedal is flush with support (2).
   d. Install washer (5) and nut (6) on bolt (3).
3. **Torque nut (6) 100 to 150 INCH-POUNDS.**
   a. Hold bolt (3).
   b. Torque nut (6) to **100 INCH-POUNDS.**
   c. Increase torque to aline cotter pin holes, but do not exceed **150 INCH-POUNDS.**
   d. Install new cotter pin (7).



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4. Install rod end of master cylinder (8) on pedal clevis (9).

a. Position rod end of master cylinder (8) with pedal clevis (9) so holes are alined.

b Install bushing (10) into holes in rod end (8) and pedal clevis (9).

c. Insert bolt (11) through bushing (10) from inboard side.

d. Hold bolt (11).

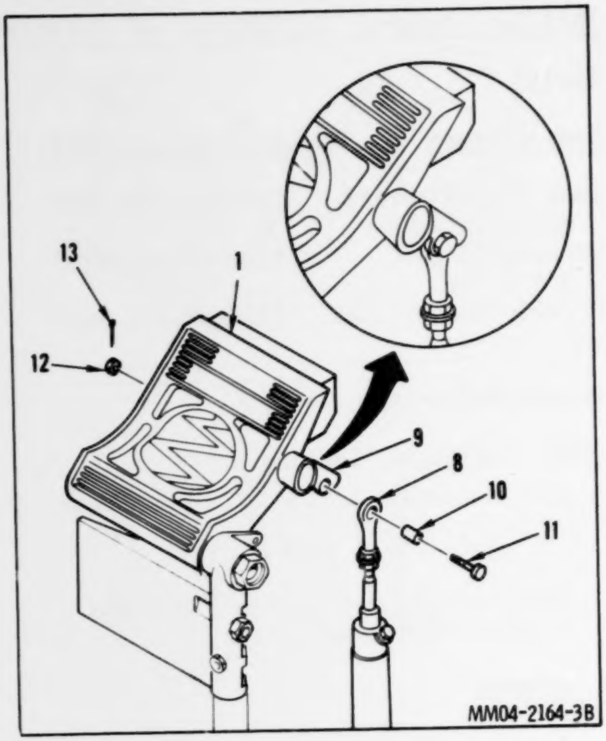
e. Install nut (12).

f. Tighten nut (12) to aline cotter pin hole.

g. Install new cotter pin (13).

5. Inspect (TI).

6. Perform flight control operational check (TM 55-1520-238-T).



END OF TASK

11-5-67. CPG DIRECTIONAL CONTROL PEDAL WEIGHT REMOVAL/INSTALLATION 11-5-67

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque, 3/8 Drive	5120-00-288-8865
Screwdriver Bit Set	5120-00-678-5057

Materials/Parts:

(E59) Compound, Sealing

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-5-65	CPG directional pedals removed

NOTE

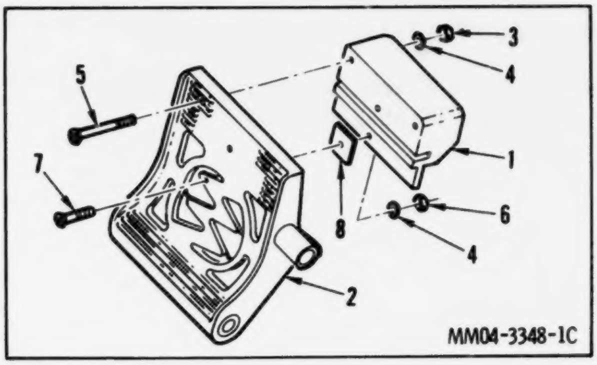
This task is typical for left and right directional pedals.

A. REMOVAL

1. Remove weight (1) from pedal (2).

   a. Remove three nuts (3), washers (4), and screws (5).

   b. Remove nut (6), washer (4), screw (7), shim (8), and weight (1) from pedal (2).



B. CLEANING

1. Wipe removed and attaching parts with a clean rag.

2. Remove sealant residue from pedal:

C. INSPECTION

1. Check removed and attaching parts for damage and wear (para 11-5-1).

2. Check removed and attaching parts for corrosion (para 1-5-38).

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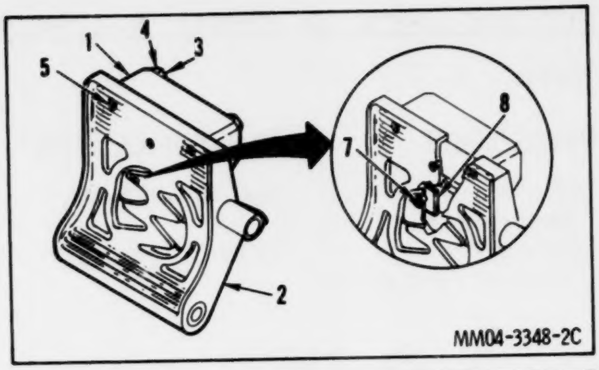
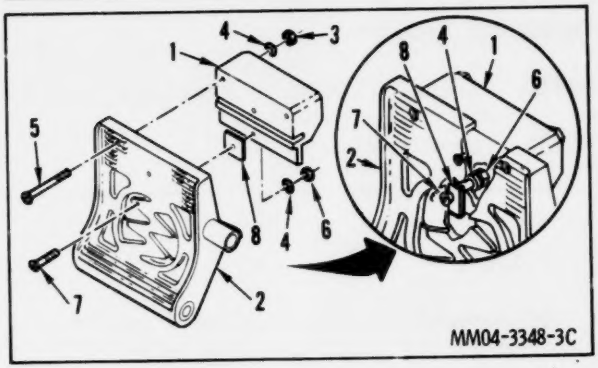
D. INSTALLATION

1. **Install weight (1) on pedal (2).** Torque three screws (5) to **70 INCH-POUNDS.** Torque one screw (7) to **20 INCH-POUNDS.**
    - a. Peel shim (8) to fill void between weight (1) and pedal (2).
    - b. Apply sealant in void between weight (1) and pedal (2). Use sealing compound (E59).
    - c. Aline shim (8) and weight (1) on pedal (2).
    - d. Install screw (7) through pedal (2), shim (8), weight (1), washer (4), and nut (6).
    - e. Hold nut (3). Torque screw (7) to **20 INCH-POUNDS.**
    - f. Install three screws (5), three washers (4), and three nuts (3).
    - g. Hold three nuts (3). Torque three screws (5) to **70 INCH-POUNDS.**
2. **Inspect (TI).**
3. **Install CPG directional pedal (para 11-5-66).**





END OF TASK

11-5-68. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION 11-5-68

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control Systems	1730-01-240-1577

Personnel Required:

68R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

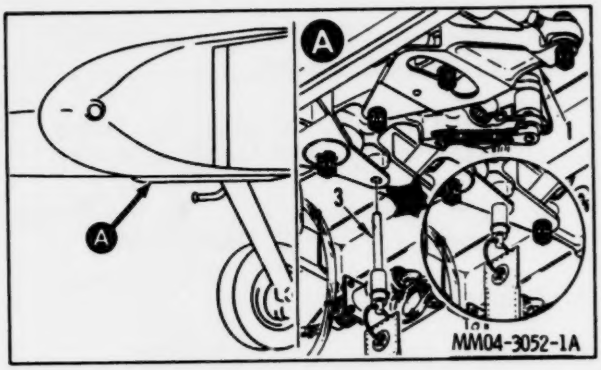
TM 55-1520-238-T
TM 9-1090-208-23

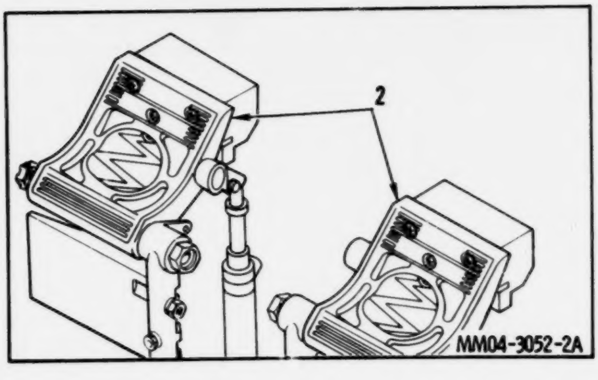
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
TM 9-1090-208-23	Gun turret removed Roller chute, sprocket chute, and dust cover removed 30mm gun removed
2-2-2	Fairing L540 removed

A. REMOVAL

1. Disconnect FS 542 push-pull rod from directional serovcylinder input lever (para 7-2-39).
2. Enter pilot station (para 1-7-1). Observe all safety precautions.
3. Position pilot directional SPAD (1).
4. Slowly move pilot directional pedals (2) to aline rig pin holes in SPAD (1).
5. Install -9 rig pin (3) in SPAD (1).





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11-5-68. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-5-68

6. **Detach connector L21 (4) from connector J1048 (5).**

7. **Remove magnetic brake (6).**

   a. Hold bolt (9).

   NOTE

   Install laminated washers in same position as removed.

   b. Remove nut (10) and washer (11).

   c. Remove bolt (9) and washer (12).

   d. Remove four bolts (13), outside washers (14), inside washers (15), and laminated washers (16).

   e. Slide brake shaft (8) out of shaft (7). Remove magnetic brake (6).

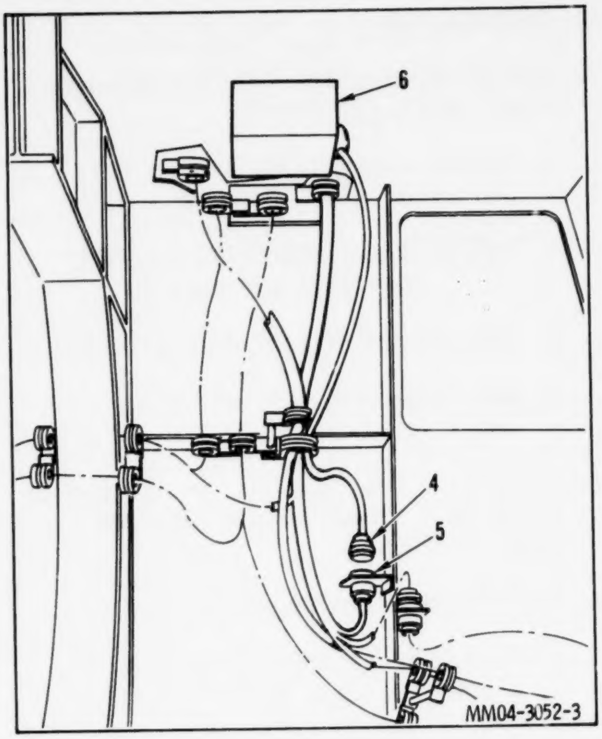
B. **CLEANING**

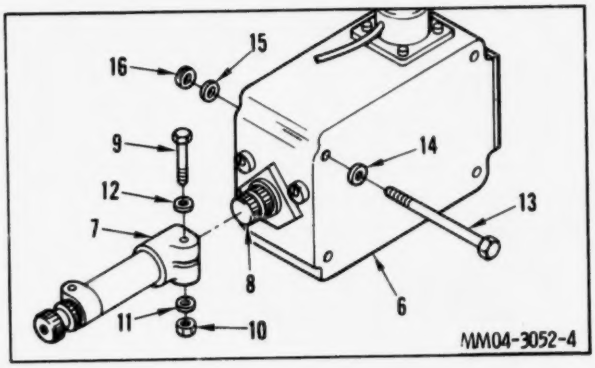
Wipe removed and attaching parts with a clean rag.

C. **INSPECTION**

1. **Check removed and attaching parts for damage and wear** (para 11-5-1).

2. **Check removed and attaching parts for corrosion** (para 1-5-38).





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11-5-68. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-5-68

D. INSTALLATION

1. **Establish midpoint (17) of magnetic brake shaft (8) travel.**

   a. Rotate brake shaft (8) to full left stop (18) and mark A.

   b. Rotate brake shaft (8) to full right stop (19) and mark B.

   c. Measure and bisect dimension C.

   d. Mark midpoint (17) of brake shaft (8) travel.

2. **Install -5 rig pin (20) in rig pin holes (21) in bellcrank (22) and support (23).**

3. **Install magnetic brake (6).**

   a. Hold brake shaft (8) at midpoint (17). Position magnetic brake (6).

   b. Carefully insert brake shaft (8) into serrated bore (24) of shaft (7).

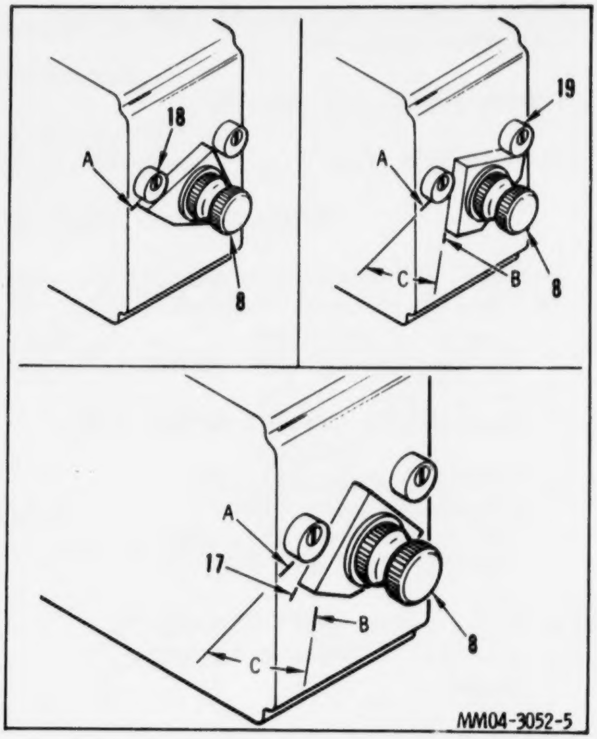
NOTE

Install laminated washers in same position as removed.

   c. Install bolt (9) through washer (12) and shaft (7).

   d. Hold bolt (9). Install washer (11) and nut (10).

   e. Install four bolts (13) through outside washers (14), magnetic brake (6) inside washers (15), and laminated washers (16) into deck (17).



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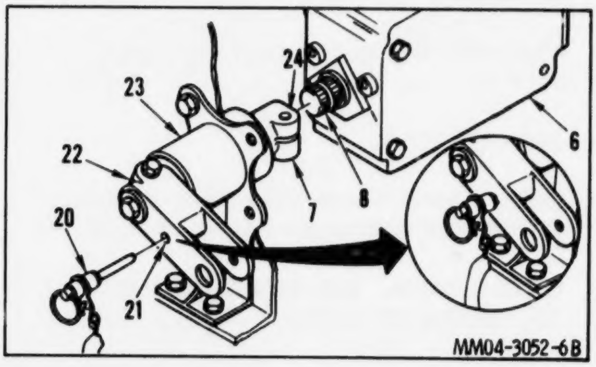

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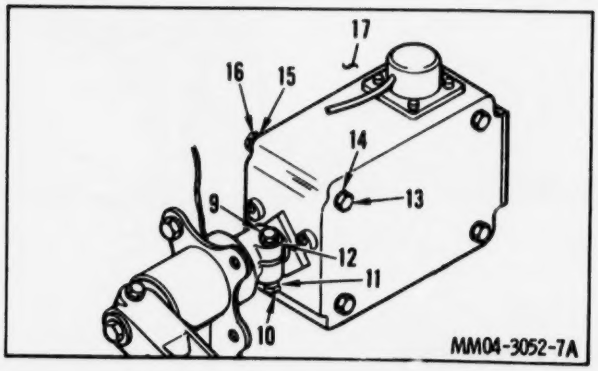

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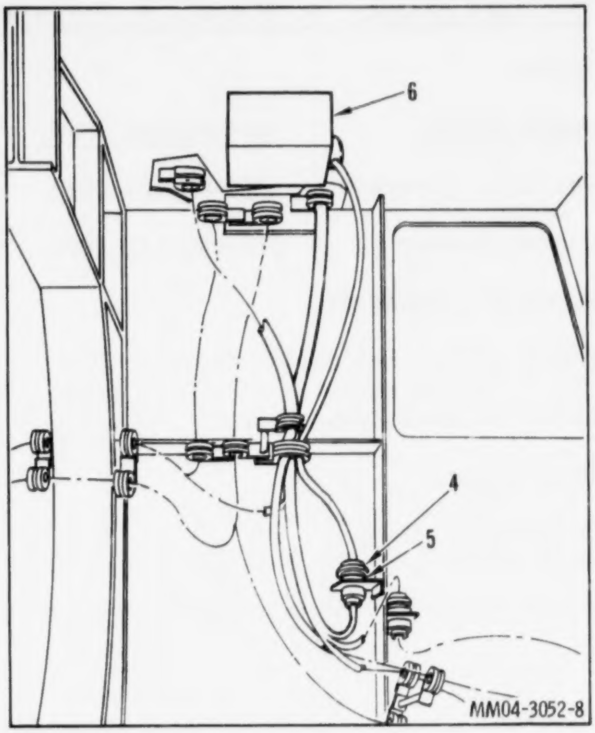
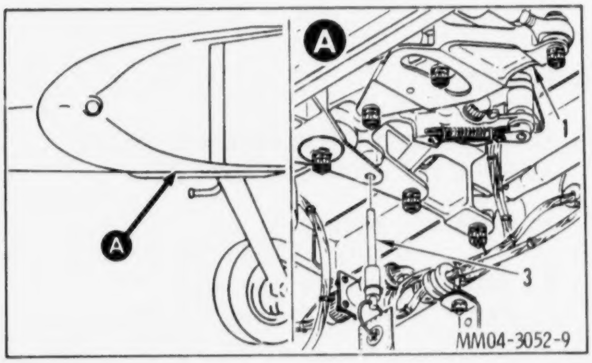
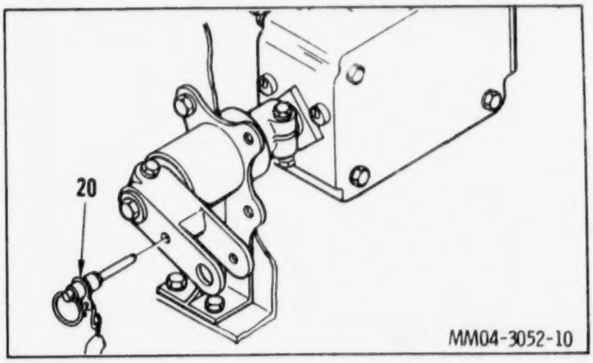
11-5-68. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION (cont) 11-5-68

4. Attach connector L21 (4) to connector J1048 (5).
5. Inspect (TI).
6. Remove rig pins (3) and (20).
7. Install FS 542 push-pull rod to directional servocylinder input lever (para 7-2-40).
8. Secure fairing L540 (para 2-2-2).
9. Install roller chute, sprocket chute, and dust cover (TM 9-1090-208-23).
10. Install gun turret (TM 9-1090-208-23).
11. Install 30mm gun (TM 9-1090-208-23).
12. Perform flight control system operational check (TM 55-1520-238-T).







END OF TASK

11-5-69. DIRECTIONAL MAGNETIC BRAKE SUPPORT REMOVAL/INSTALLATION 11-5-69

This task covers: A. REMOVAL B. CLEANING C. INSPECTION D. INSTALLATION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Wrench, Torque	5120-00-542-4489

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Fairings R194, L194 and L540 removed
11-5-62	Pilot directional feel spring cartridge removed
11-5-68	Bolts connecting magnetic brake shaft to brake support assembly shaft loosened
TM 9-1090-208-23	Roller chute, sprocket chute, and dust cover removed
TM 9-1090-208-23	Gun turret removed
TM 9-1090-208-23	30mm gun removed

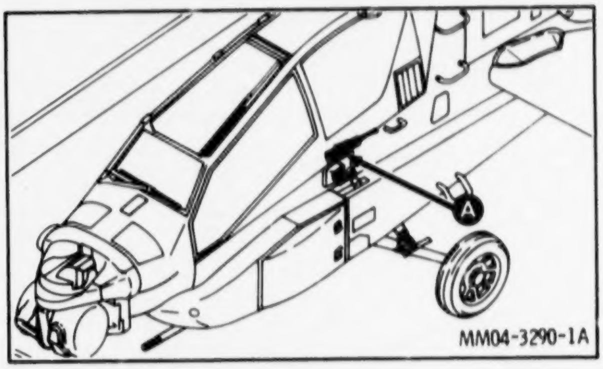
A. REMOVAL

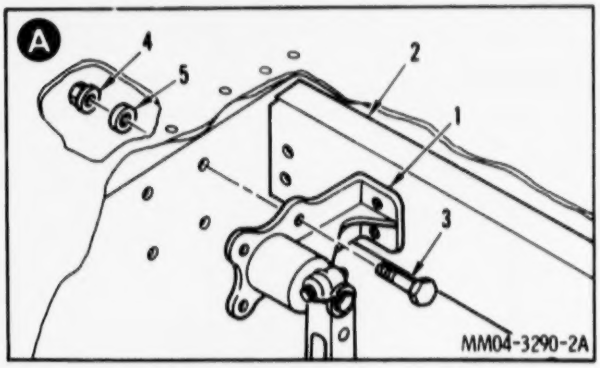
1. **Remove directional magnetic brake support (1) from airframe (2).**

   a. Hold six bolts (3).

   b. Remove six nuts (4) and washers (5). Remove six bolts (3).

   c. Remove directional magnetic brake support (1).





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11-5-69. DIRECTIONAL MAGNETIC BRAKE SUPPORT REMOVAL/INSTALLATION (cont)

B. CLEANING

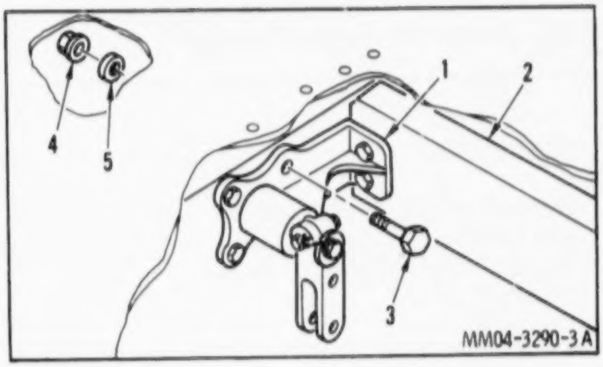
Wipe removed and attaching parts with a clean rag.

C. INSPECTION

1. Check support for damage. None allowed.
2. Check nuts and bolts for stripped threads. None allowed.
3. Check support for corrosion (1-5-38).

D. INSTALLATION

1. Install support (1) on airframe (2). Torque six bolts (3) to 41 INCH-POUNDS.
    a. Position support (1) on airframe (2).
    b. Install six bolts (3) through six washers (5), support (1) and airframe (2).
    c. Hold six nuts (4). Torque six bolts (3) to 41 INCH-POUNDS.
2. Inspect (TI).
3. Pilot directional feel spring cartridge installed (para 11-5-63).
4. Tighten bolts connecting magnetic brake shaft to brake support shaft (para 11-5-68).
5. Perform flight control system operational check (TM 55-1520-238-T).
6. Roller chute, sprocket chute, and dust cover installed (TM 9-1090-208-23).
7. Gun turret installed (TM 9-1090-208-23).
8. 30mm gun installed (TM 9-1090-208-23).
9. Secure fairings L194, R194 and L540 (para 2-2-2).



END OF TASK

11-5-70. DIRECTIONAL MAGNETIC BRAKE SUPPORT REPAIR (AVIM)

This task covers: A. DISASSEMBLY B. CLEANING C. INSPECTION D. REPAIR E. REASSEMBLY

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Powertrain Repairer's	5180-00-003-5267
Wrench, Torque	5120-00-542-4489

Materials/Parts:

(E29) Lockwire

Personnel Required:

68D10	Aircraft Powertrain Repairer
66R30	Inspector/Supervisor

References:

TM 55-1500-322-24

A. DISASSEMBLY

1. **Remove pilot directional bellcrank (1) from pilot directional magnetic brake support (2).**

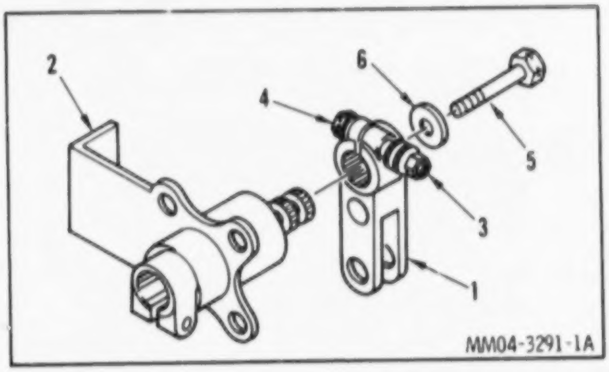
   a. Remove lockwire.

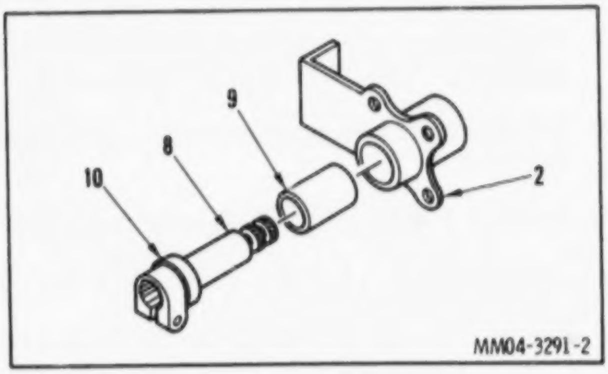
   b. Hold nut (3). Loosen bolt (4).

   c. Remove bolt (5) and washer (6).

   d. Remove bellcrank (1).

2. **Remove shaft (8), spacer (9), and bearing (10) from support (2).**





B. CLEANING

Wipe removed and attaching parts with a clean rag.

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11-5-70. DIRECTIONAL MAGNETIC BRAKE SUPPORT REPAIR (AVIM) (cont)

C. INSPECTION

1. Check shaft and spacer for scoring, nicks, or scratches. None allowed.
2. Check bearing for scratches, cracks, or wear. None allowed.
3. Check shaft, spacer, and bearing for corrosion. None allowed.

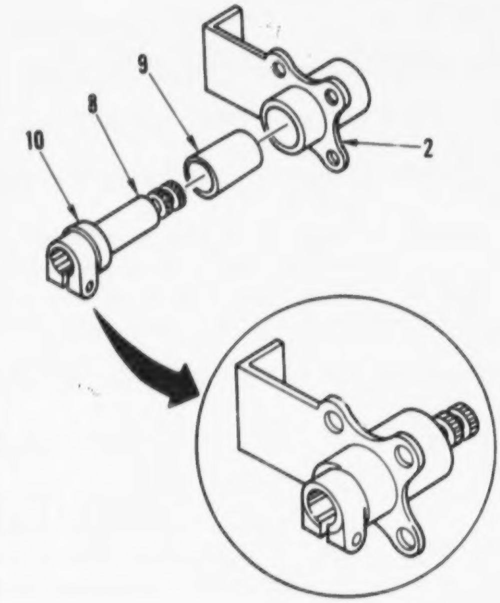
D. REPAIR

Repair directional magnetic brake support by replacing bearing (10) (TM 55-1500-322-24).

E. REASSEMBLY

1. Install bearing (10), spacer (9), and shaft (8) in support (2).
2. Install bellcrank (1) on support (2). Torque bolts (5) and (4) to **40 INCH-POUNDS**.
   a. Install washer (6) and bolt (5). Torque bolt (5) to **40 INCH-POUNDS**.
   b. Install bolt (4) and nut (3). Hold nut (3). Torque bolt (4) to **40 INCH-POUNDS**.
   c. Lockwire bolt (5) to bolt (4). Use lockwire (E29).
3. Inspect (TI).

END OF TASK



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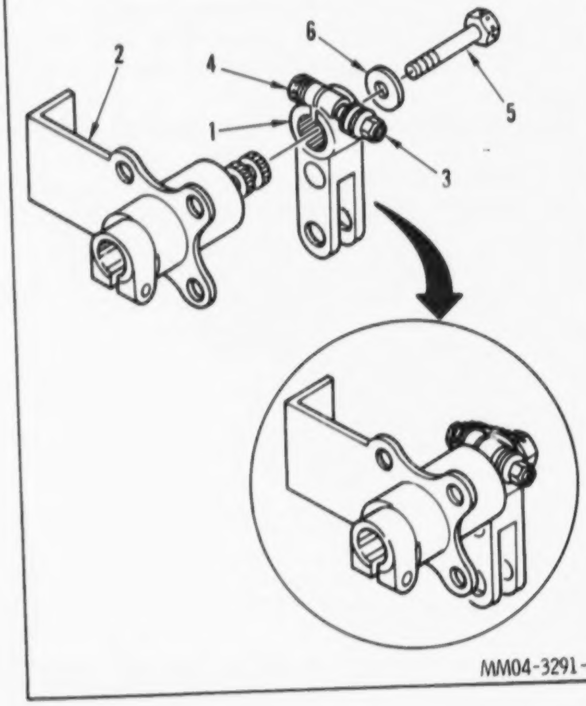

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Section VI. FLIGHT CONTROLS RIGGING MAINTENANCE

11-6-1. RIGGING FLIGHT CONTROLS 11-6-1

1. To rig collective flight control system, perform following paragraphs in order:

11-6-2	Rigging collective flight controls between pilot and CPG collective sticks.
11-6-3	Rigging collective flight controls between pilot collective stick and collective servocylinder.
11-6-4	Rigging pilot and CPG collective stick stop bolts.
11-6-5	Rigging collective upper flight controls.

2. To rig longitudinal flight control system, perform following paragraphs in order:

11-6-6	Rigging longitudinal flight controls between pilot and CPG cyclic stick.
11-6-7	Rigging longitudinal flight controls between pilot cyclic stick and longitudinal servocylinder.
11-6-8	Rigging pilot and CPG cyclic stick stop bolts.
11-6-9	Rigging upper longitudinal flight controls.

3. To rig lateral flight control system, perform following paragraphs in order:

11-6-10	Rigging lateral flight controls between pilot and CPG cyclic sticks.
11-6-11	Rigging lateral flight controls between pilot cyclic stick and lateral servocylinder.
11-6-12	Rigging pilot and CPG lateral cyclic stick stop bolts.
11-6-13	Rigging upper lateral flight controls.

4. To rig directional flight control system, perform following paragraphs in order:

11-6-14	Rigging directional flight controls between pilot and CPG pedals.
11-6-15	Rigging directional flight controls between pilot pedals and directional servocylinder.
11-6-16	Rigging pilot and CPG directional pedal stop bolts.
11-6-17	Rigging directional upper flight controls.

END OF TASK

11-6-2. RIGGING COLLECTIVE FLIGHT CONTROLS BETWEEN PILOT AND CPG COLLECTIVE STICKS 11-6-2

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

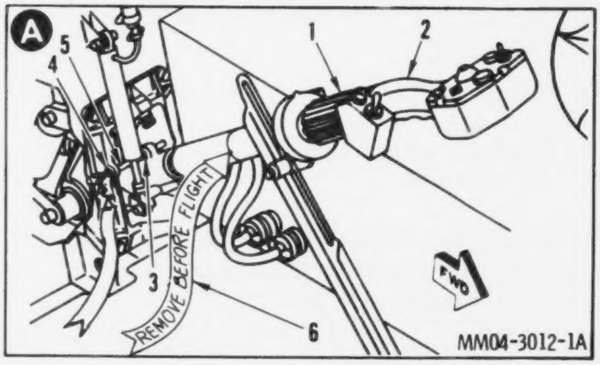
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-54	Collective stick covers removed

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls.

1. **Disconnect collective push-pull actuator rod end from control arm** (para 7-2-42).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
3. **Rotate friction lock (1) on pilot collective stick (2) to ZERO.**
4. **Move pilot collective stick (2) slowly to aline stick rig pin hole (3) with stick housing rig pin hole (4). Install -3 rig pin (5).**
5. **Install collective stick warning flag (6).**
6. **Enter CPG station** (para 1-7-1). **Observe all safety precautions.**



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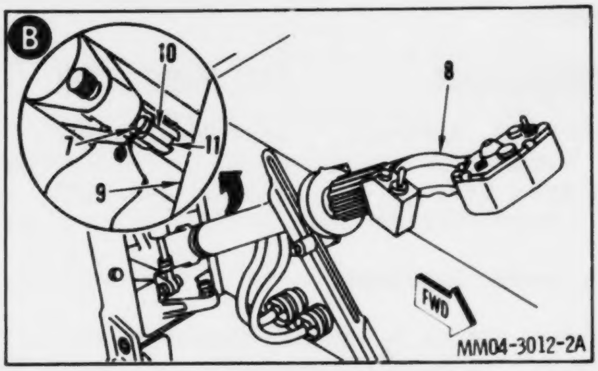
11-6-2. RIGGING COLLECTIVE FLIGHT CONTROLS BETWEEN PILOT AND CPG COLLECTIVE STICKS (cont) 11-6-2

7. **Install -3 rig pin (7) in CPG collective stick (8) and housing (9).**
   a. If collective stick rig pin slot (10) and collective housing hole (11) are not alined, remove area weapon (TM 9-1090-208-23).
   b. Adjust forward end (12) of collective FS 96 push-pull rod (para 11-2-2) to aline rig pin slot (10) and hole (11).
8. **Remove -3 rig pin (7) from CPG collective stick (8).**
9. **Install CPG collective stick cover** (para 11-3-54).
10. **Remove -3 rig pin (5) from pilot collective stick (2).**
11. **Install pilot collective stick cover** (para 11-3-54).
12. **Connect collective push-pull actuator rod end to control arm** (para 7-2-43).
13. **Remove collective stick warning flag (6).**
14. **Inspect (TI).**
15. **Install area weapon** (TM 9-1090-208-23) **if removed.**
16. **Perform collective flight control rigging operational check** (TM 55-1520-238-T).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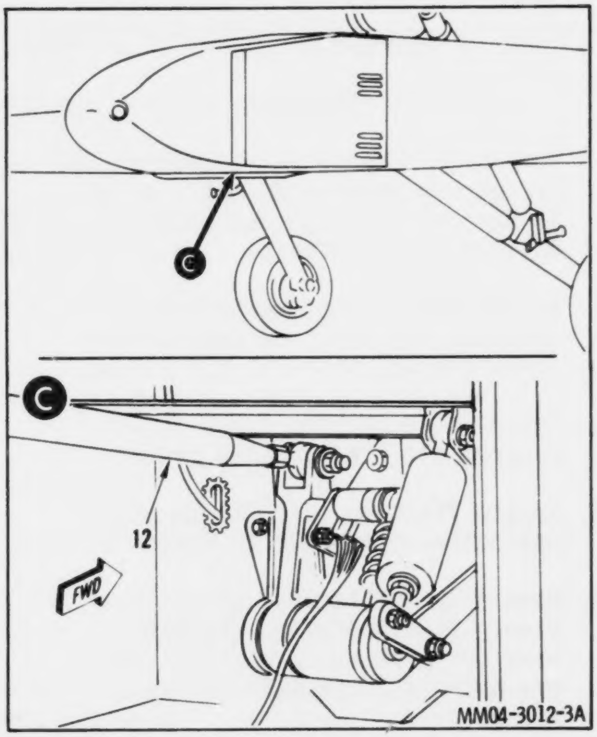
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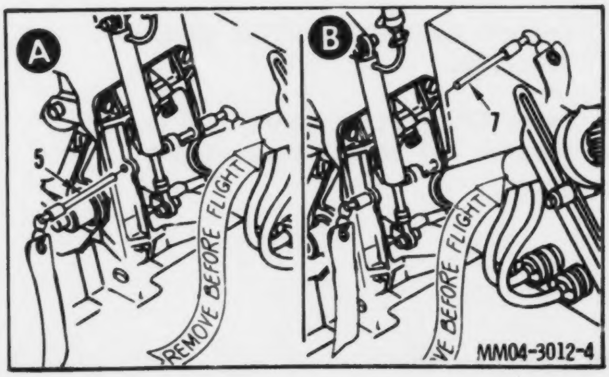
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END OF TASK

11-6-3. RIGGING COLLECTIVE FLIGHT CONTROLS BETWEEN PILOT COLLECTIVE STICK AND COLLECTIVE SEROVCYLINDER 11-6-3

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Ground Power Unit (AGPU)	1730-01-144-1879
Headset, Microphone (2)	5965-00-755-4656
Cord Assembly, Electrical, Maintenance-Headset	5995-01-163-9549

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels R200 and L200 removed
11-3-54	Remove pilot collective stick cover
11-6-2	Rigging collective flight controls between pilot and CPG collective sticks

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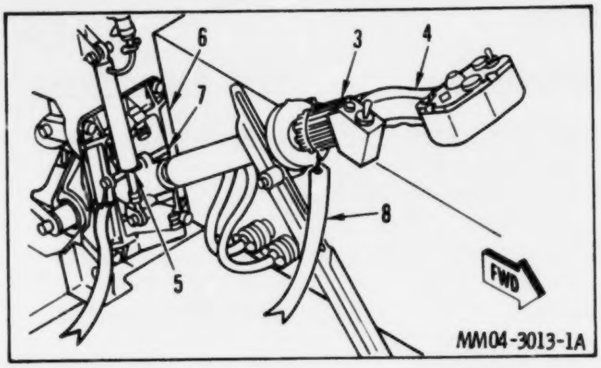
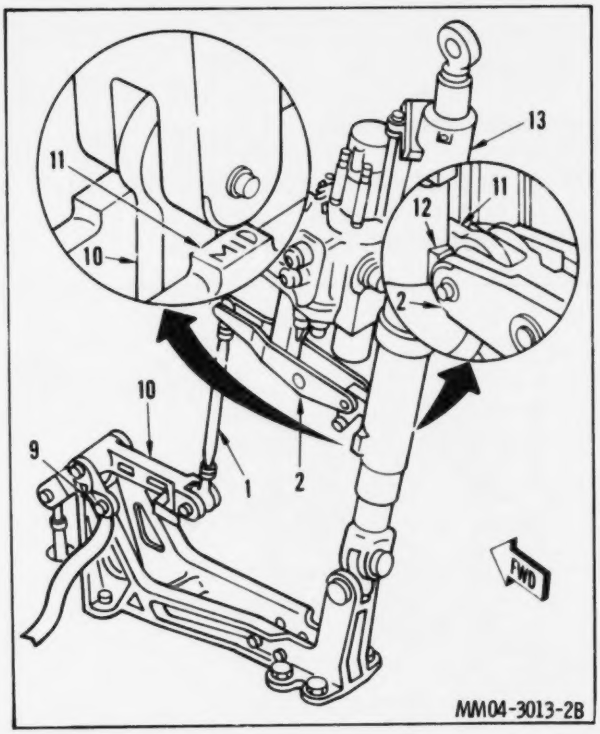
11-6-3. RIGGING COLLECTIVE FLIGHT CONTROLS BETWEEN PILOT COLLECTIVE STICK AND COLLECTIVE SERVOCYLINDER (cont) 11-6-3





WARNING

Application of external power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying external power. Inform all persons working on helicopter that external power is to be applied. If injury occurs, seek medical aid.

CAUTION

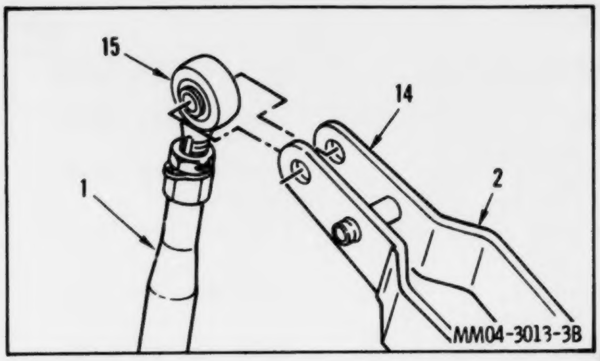
To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

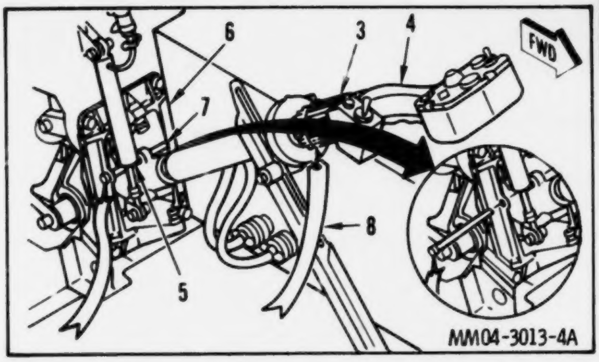
1. Disconnect FS 165 push-pull rod (1) from collective servocylinder input lever (2) (para 7-2-42). Secure rod (1) to prevent damage when controls are moved.
2. Enter pilot station (para 1-7-1). Observe all safety precautions.
3. Rotate friction lock (3) on collective stick (4) to ZERO.
4. Slowly position collective stick (4) to aline rig pin holes (5) in collective stick (4) and housing (6). Install -3 rig pin (7).
5. Install collective stick warning flag (8) on pilot collective stick (4).
6. Apply external hydraulic power (para 1-7-18).
7. Install -9 rig pin (9) into FS 165 bellcrank (10).
8. Slowly move collective servocylinder input lever (2) to aline lower lever (11) with upper edge of boss (12) on servocylinder body (13).

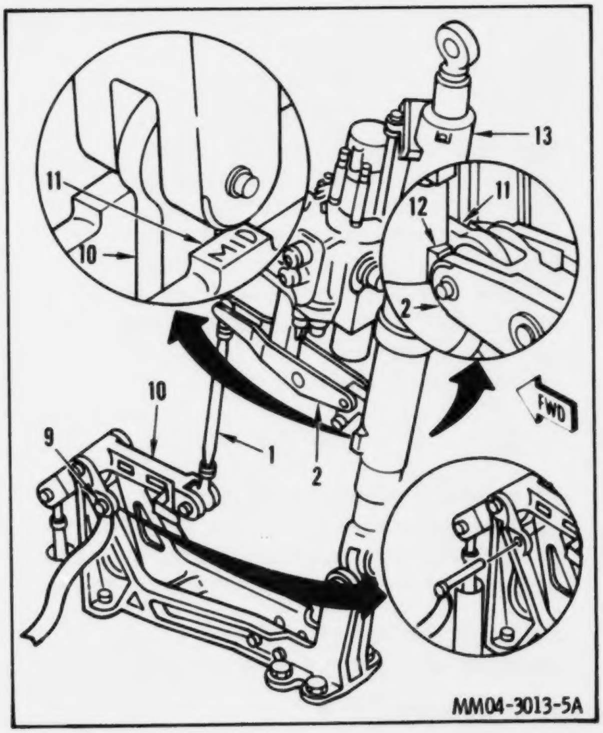
GO TO NEXT PAGE

11-6-3. RIGGING COLLECTIVE FLIGHT CONTROLS BETWEEN PILOT COLLECTIVE STICK AND COLLECTIVE SERVOCYLINDER (cont) 11-6-3

9. **Check that holes in input lever (14) aline with FS 165 push-pull rod end (1).**
   a. If holes in input lever (14) do not aline with rod end (15), adjust rod end (15) on upper end of FS 165 push-pull rod (1) (para 11-2-2) to aline holes in lever (14).
   b. If holes in input lever (14) aline with rod end (15) go to next step.
10. **Connect FS 165 push-pull rod (1) to input lever** (para 7-2-43).
11. **Remove -3 rig pin (7) from collective stick (4), and -9 rig pin (9) from FS 165 bellcrank (10).**
12. **Remove collective stick warning flag (8).**
13. **Inspect (TI).**
14. **Perform collective flight control rigging operational check** (TM 55-1520-238-T).
15. **Install pilot collective cover** (para 11-3-54).
16. **Secure panels L200 and R200** (para 2-2-2).
17. **Disconnect external power** (para 1-7-18).







END OF TASK

11-6-4. RIGGING PILOT AND CPG COLLECTIVE STICK STOP BOLTS 11-6-4

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Ground Power Unit (AGPU)	1730-01-144-1879
Headset, Microphone (2)	5965-00-755-4656
Cord Assembly, Electrical Maintenance-Headset	5995-01-163-9549
Caliper, Vernier	5210-00-234-8017

Materials/Parts:

(E81) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels R200 and L200 removed
1-7-18	External primary hydraulic power connected
11-3-54	Pilot and CPG collective stick covers removed
11-6-2	Collective flight controls between pilot and CPG collective sticks rigged
11-6-3	Collective flight controls between pilot collective stick and collective servocylinder rigged
TM 55-1520-238-T	ICS connected

WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. **Enter pilot station (para 1-7-1). Observe all safety precautions.**

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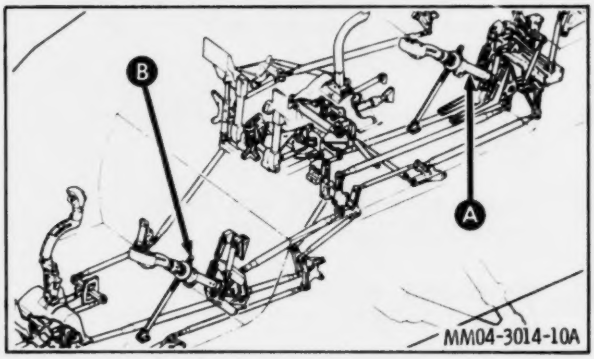
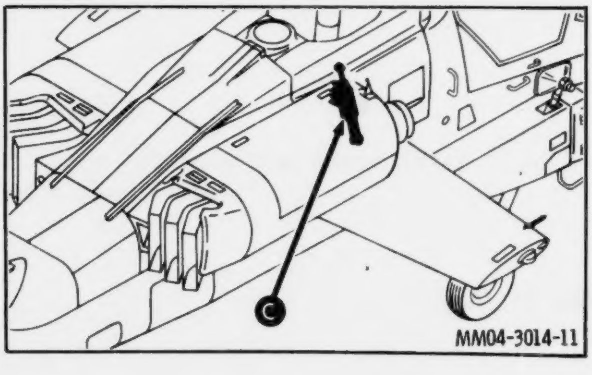




11-6-4. RIGGING PILOT AND CPG COLLECTIVE STICK STOP BOLTS (cont) 11-6-4

2. **Rotate friction lock (1) counterclockwise on pilot collective stick (2) and friction lock (3) counterclockwise on CPG stick (4) to ZERO.**

3. **Slowly move pilot collective stick (2) to aline rig pin holes in stick (2) and housing (5).** Install -3 rig pin (6).

4. **Check that collective servocylinder lower lever (9) is alined with upper edge of boss (7) on servocylinder (8).**

   a. If lower lever (9) is not alined with upper edge of boss (7) on servocylinder, rig controls between pilot collective stick (2) and collective servocylinder (8) (para 11-6-3).

   b. If lower lever (9) is alined with upper edge of boss (7) on servocylinder (8) go to next step.

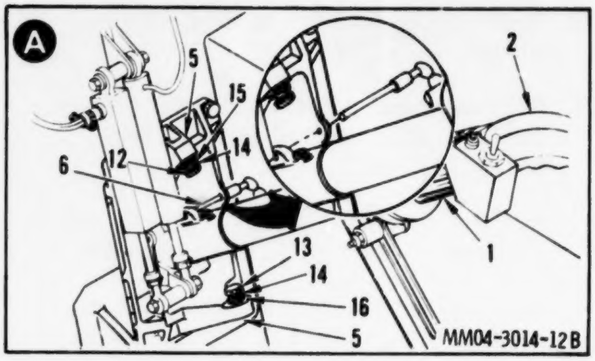
5. **Measure and record distance between valve arm (10) and collective servocylinder stop bolt (11).** This is measurement A. Use caliper.

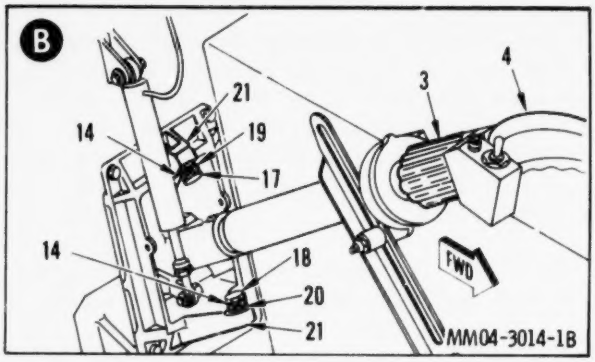
6. **Remove -3 rig pin (6) from stick (2) and housing (5).**

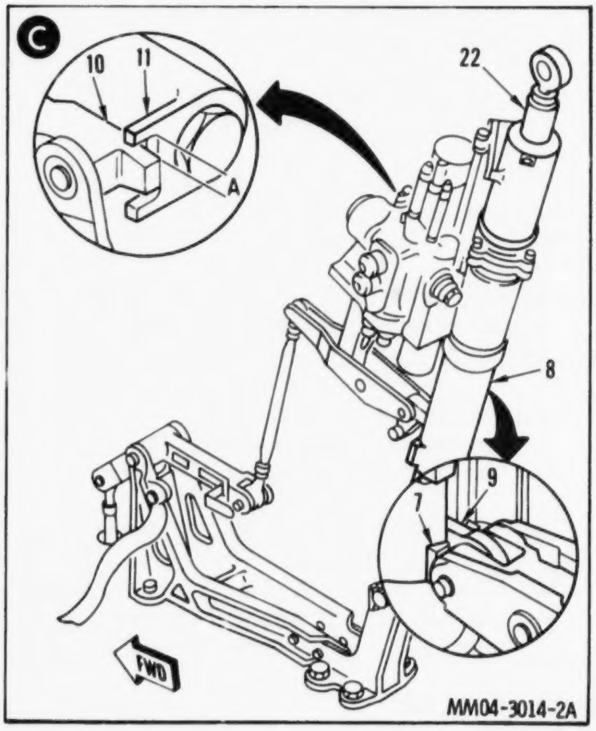
7. **Back off pilot and CPG collective stick up-limit stop bolts (12) and (17) and down-limit stop bolts (13) and (18).**

   a. Remove lockwire (14).

   b. Loosen jam nuts (15), (19), (20), and (16). Turn stop bolts (12), (17), (18), and (13) into housing (5) and (21).







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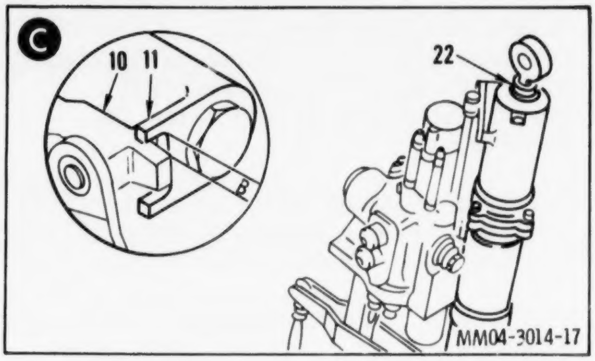
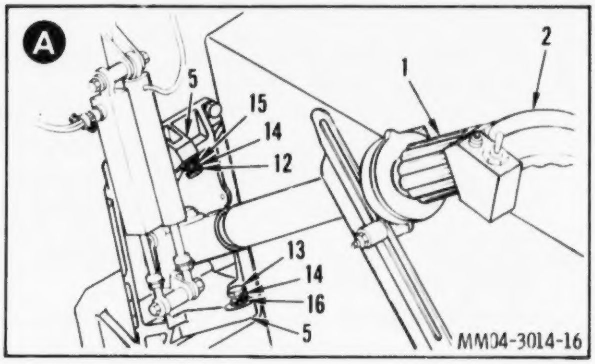
11-6-4. RIGGING PILOT AND CPG COLLECTIVE STICK STOP BOLTS (cont) 11-6-4





8. **Observe collective servocylinder piston (22) travel.**

9. **Fully extend piston (22) by slowly pulling up on pilot collective stick (2).**

   a. Pull up on stick (2) slowly until piston (22) is fully extended.

   b. Stop moving stick (2). Rotate friction lock (1) clockwise to hold stick in position.

10. **Measure and record distance between valve arm (10) and collective servocylinder stop bolt (11).** This is measurement B. The difference between measurements A and B must be less than **0.030 inch.** Use vernier caliper.

    a. If difference between measurements A and B is more than **0.030 inch,** slowly lower stick (2) until difference between measurement A and measurement B is less than **0.030 inch.**

    b. If measurement B is less than 0.030, go to step 15.

    c. Use friction lock (1) on pilot collective stick (2) to hold stick in position.

11. **Adjust pilot collective stick up limit stop bolt (12) to contact stick (2).**

    a. Rotate stop bolt (12) counterclockwise until it contacts stick (2).

    b. Hold stop bolt (12). Tighten jam nut (15).

    c. Lockwire stop bolt (12) and jam nut (15). Use lockwire (E81).

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12. **Hold pilot collective stick against up stop bolt.** Adjust CPG collective stick up stop bolt (17) to contact 0.020-inch thickness gage (23) held between CPG collective stick (4) and up stop bolt (17).

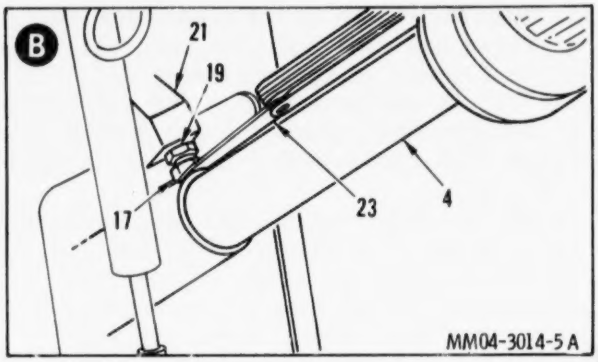
    a. With pilot stick against up stop bolt.

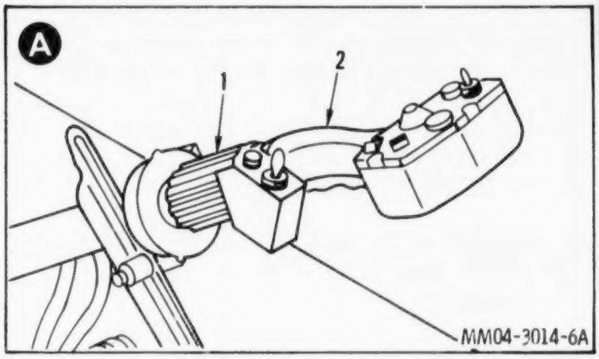
    b. Place 0.020-inch thickness gage (23) against CPG stick (4).

    c. Rotate up stop bolt (17) counterclockwise until it contacts thickness gage (23).

    d. Hold stop bolt (17). Tighten jam nut (19).

    e. Lockwire stop bolt (17) to jam nut (19). Use lockwire (E81).





13. **Rotate friction lock (1) on pilot collective stick (2) to ZERO.**

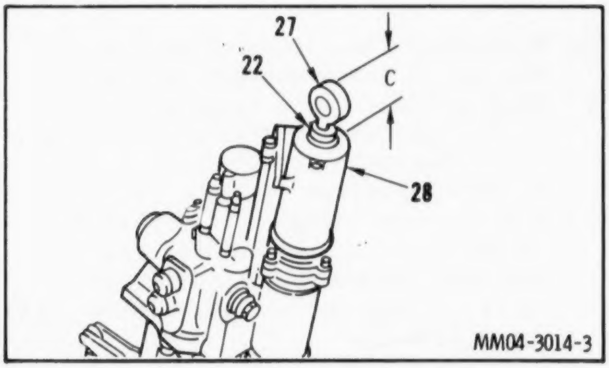
14. **Measure and record distance between actuator rod end (27) and actuator piston housing (28).** This is measurement C.

15. **Observe collective servocylinder piston travel.**

16. **Fully retract piston (22) by slowly lowering pilot collective stick (2).**

    a. Slowly lower stick (2) until piston (22) is fully retracted.

    b. Stop moving stick (2). Rotate friction lock (1) counterclockwise to hold stick (2) in position.



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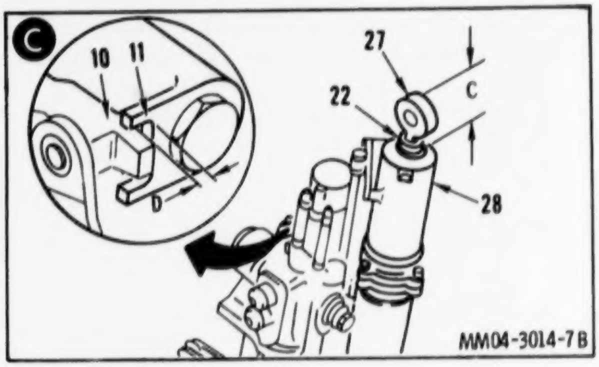
11-6-4. RIGGING PILOT AND CPG COLLECTIVE STICK STOP BOLTS (cont) 11-6-4

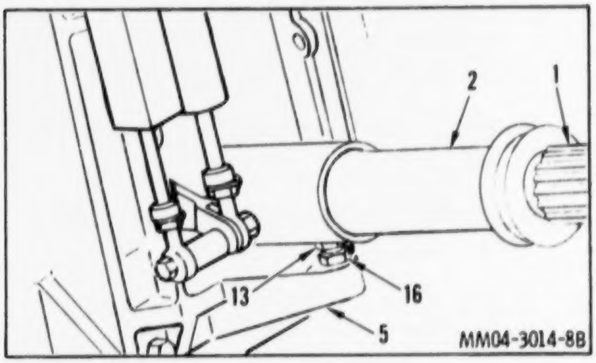
17. **Measure and record distance between valve arm (10) and stop bolt (11) on collective servocylinder (7).** This is measurement D. The difference between measurements A and D must be less than **0.030-inch.** Use caliper.

    a. If difference between measurement A and C is more than **0.030-inch,** slowly raise stick (2) until difference between measurement A and measurement C is less than **0.030-inch.**

    b. If measurement is between 0.000 and 0.030 inch, go to step 15.

    c. Use friction lock (1) on pilot collective stick (2) to hold stick in position.





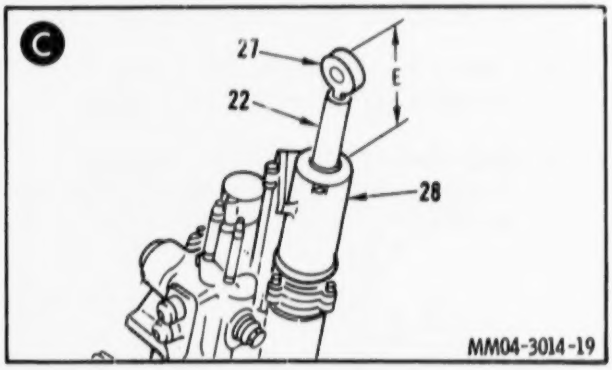
18. **Adjust pilot collective stick down limit stop bolt (13) to contact stick (2).**

    a. Rotate stop bolt (13) counterclockwise until it contacts stick (2).

    b. Hold stop bolt (13). Tighten jam nut (16).

    c. Lockwire stop bolt (13) and jam nut (16). Use lockwire (E81).

19. **Measure distance between actuator rod end (27) and actuator piston housing (28).** This is measurement E. Difference between measurements C and E is actuator piston travel. Difference between C and E shall be 3.50 to 3.56 inches. If difference is not 3.50 to 3.56 inches, rig controls between pilot collective stick (2) and collective actuator (22) (para 11-6-3).



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11-6-4. RIGGING PILOT AND CPG COLLECTIVE STICK STOP BOLTS (cont) 11-6-4

20. **Hold pilot collective stick (2) against down-stop bolt (13).** Adjust CPG collective stick (4) down stop bolt (18) to contact 0.020-inch thickness gage (23) held between CPG collective stick (4) and down-stop bolt (18).

    a. Hold pilot stick (2) against down-stop bolt (13).

    b. Hold 0.020-inch thickness gage (23) against CPG stick (4).

    c. Rotate stop bolt (18) counterclockwise until it contacts thickness gage (23).

    d. Hold stop bolt (18). Tighten nut (20).

    e. Lockwire stop bolt (18) and nut (20). Use lockwire (E81).

21. **Inspect (TI).**

22. **Install actuator engine control rod** (para 4-8-40).

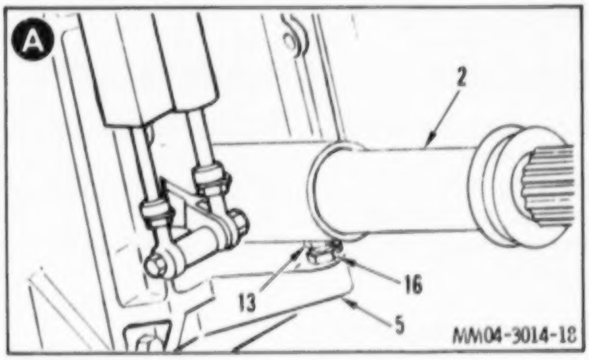
23. **Rig collective upper flight controls** (para 11-6-5).

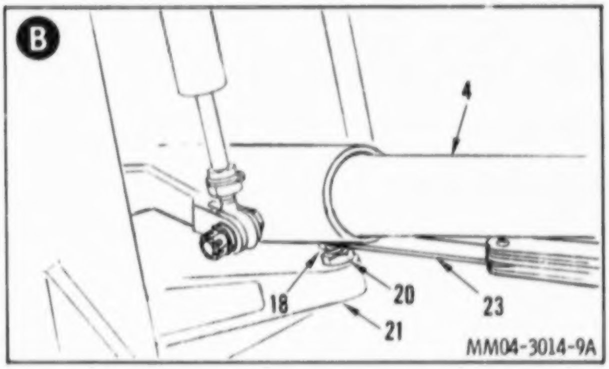
24. **Perform collective flight control rigging operational check** (TM 55-1520-238-T).

25. **Shut down AGPU** (para 1-7-18).

26. **Install pilot and CPG collective stick covers** (para 11-3-54).

27. **Secure panels R200 and L200** (para 2-2-2).





END OF TASK

11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS 11-6-5

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Ground Power Unit (AGPU)	1730-01-144-1897

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels L200 and R200 removed
11-3-54	Pilot collective stick cover removed
1-7-18	External primary hydraulic power connected
11-6-2	Collective flight controls between pilot and CPG collective sticks rigged
11-6-3	Collective flight controls controls between pilot collective stick and collective servocylinder rigged
11-6-4	Pilot and collective stick stop bolts rigged

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11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS (cont) 11-6-5

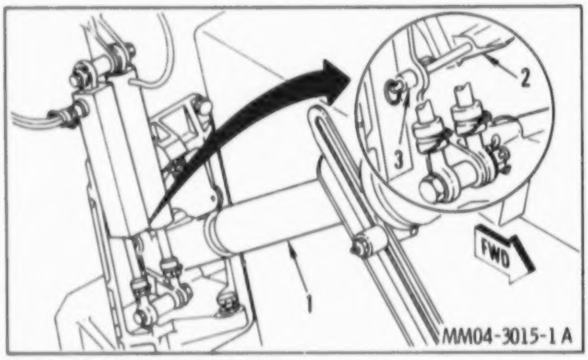
WARNING

- **Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.**
- **To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.**

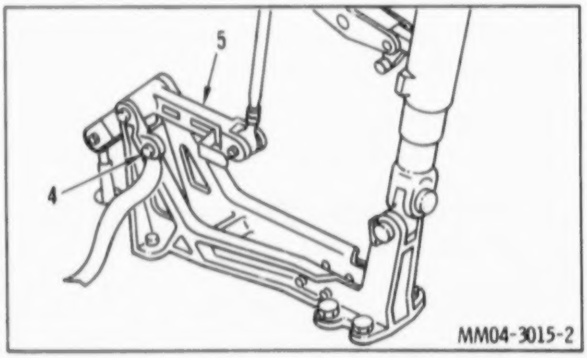
CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Slowly move pilot collective stick (1) to aline rig pin holes in stick (1) and housing (2).** Install -3 rig pin (3).



3. **Install -9 rig pin (4) in collective FS 165 bellcrank (5).**
   a. If -9 rig pin (4) cannot be installed, rig collective flight controls between pilot collective stick and collective servocylinder (para 11-6-3).
   b. If -9 rig pin can be installed, go to next step.



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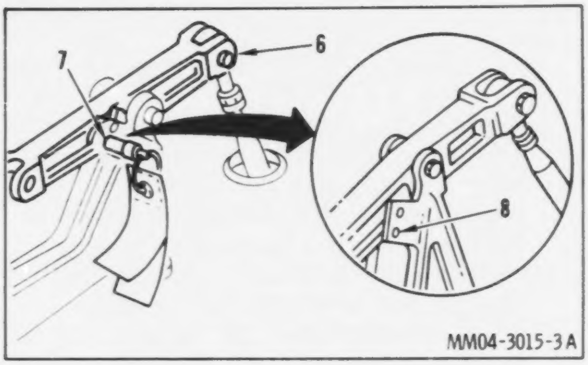
11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS (cont) 11-6-5

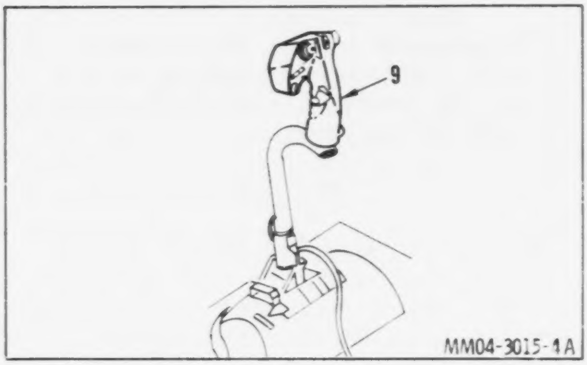
4. **Observe longitudinal cyclic FS 165 bellcrank (6).**



MM04-3015-3 A

5. **Slowly move pilot cyclic stick (9) to aline level swashplate rig pin holes in FS 165 bellcrank (6).** Install -5 rig pin (7) in FS 165 bellcrank (6) at level swashplate position (8).

6. **Observe lateral cyclic FS 165 bellcrank (10).**



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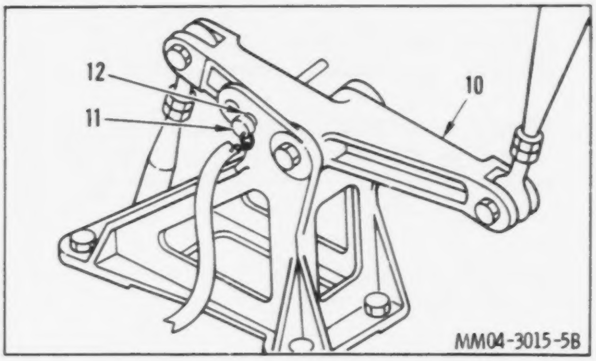
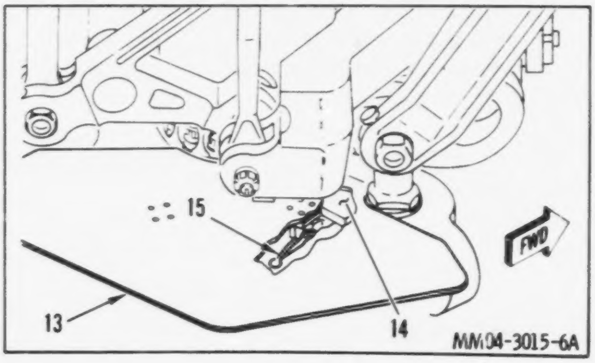
7. **Slowly move pilot cyclic stick (9) to aline level swashplate rig pin holes in lateral FS 165 bellcrank (10).** Install -5 rig pin (11) in FS 165 bellcrank (10) at level swashplate position (12).



MM04-3015-5B

8. **Install main rotor rigging plate (13) onto mast base (14).**
   a. Place rigging plate (13) on top of right side of mast base (14).
   b. Fasten clamps (15) under rigging plate (13).



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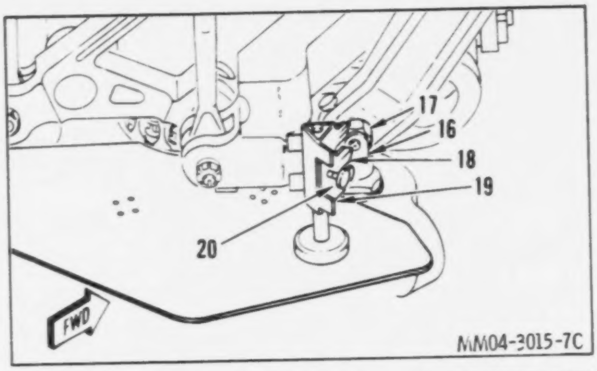
9. **Place alinement tool (16) into head of mixer support bolt (17).** Adjust BASIC DIM pointer (18) to aline with center point of alinement tool (16).

   a. Install large end of alinement tool (16) in head of mixer support bolt (17) and hold.

   b. Place rigging fixture (19) next to alinement tool (16).

   c. Loosen thumbscrew (20) and aline BASIC DIM pointer (18) with center point of alinement tool (16).

   d. Tighten thumbscrew (20).



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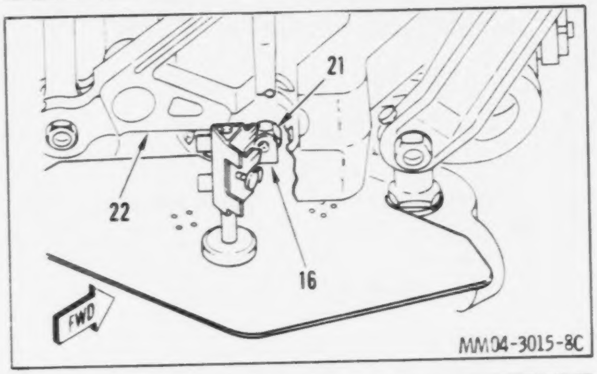

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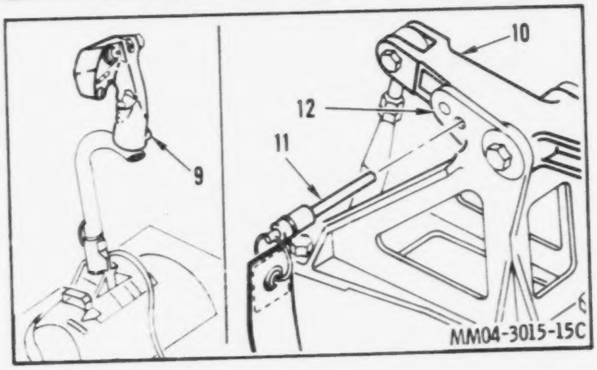

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CAUTION

To prevent damage, be sure rigging fixture is clear of mixer assembly when moving flight controls.

10. **Remove -5 rig pin (11) from lateral FS 165 bellcrank (10).**

11. **Install alinement tool (16) in forward bolt head (21) of aft longitudinal bellcrank (22).** Check that BASIC DIM pointer alines with center point of alinement tool (16).

    a. Slowly move pilot cyclic stick (9) full left until it stops.

    b. Install alinement tool (16) in forward bolt head (21) of aft longitudinal bellcrank (22).

    c. Move pilot cyclic stick (9) to aline level swashplate rig pin holes in lateral FS 165 bellcrank (10). Install -5 rig pin (11) in FS 165 bellcrank (10) at level swashplate position (12).

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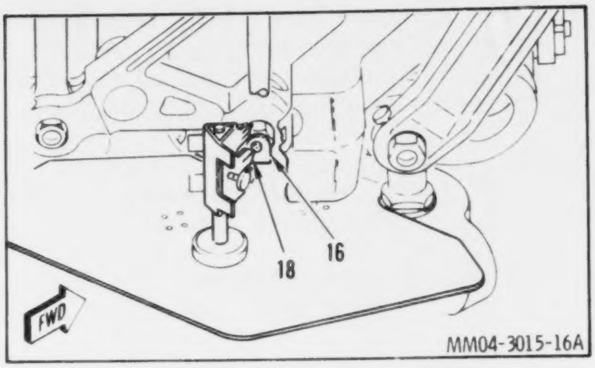
11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS (cont) 11-6-5

d. Check that BASIC DIM pointer (18) alines with center point on alinement tool (16) ±0.030-inch.

e. If BASIC DIM pointer (18) does not aline with center point on alinement tool (16) within ±0.030-inch, adjust collective servocylinder rod end (para 11-6-18).

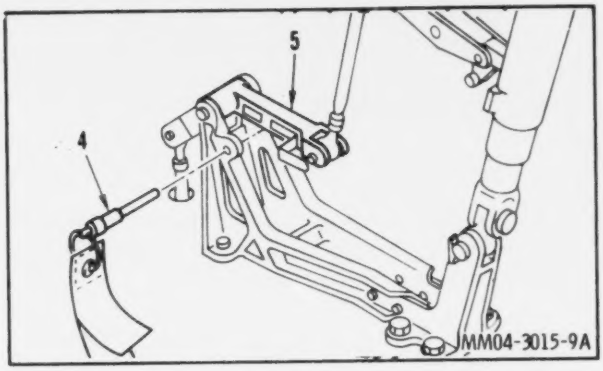
f. If BASIC DIM pointer (18) alines with center point on alinement tool (16), go to next step.



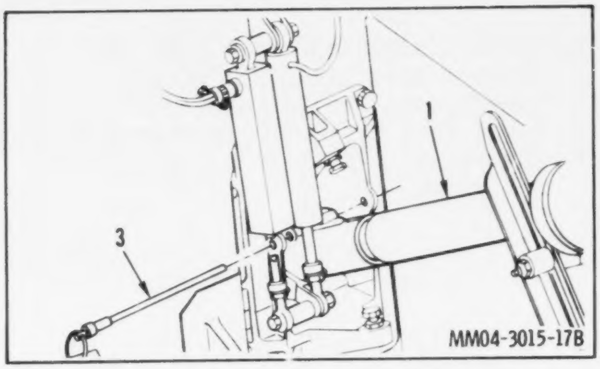
WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

12. **Remove -9 rig pin (4) from collective FS 165 bellcrank (5).**



13. **Remove -3 rig pin (3) from the collective stick (1).**



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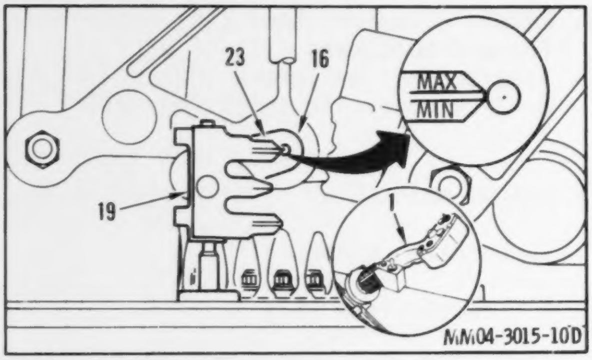
11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS (cont) 11-6-5

14. **Slowly pull pilot collective stick (1) up until it stops.** Check that center point of alinement tool (16) alines with collective UP pointer (23) on rigging fixture (19).

    a. If center point of alinement tool (16) does not fall between **MIN** and **MAX** marks on collective UP pointer (23), check pilot and CPG collective stick stop rigging (para 11-6-4).

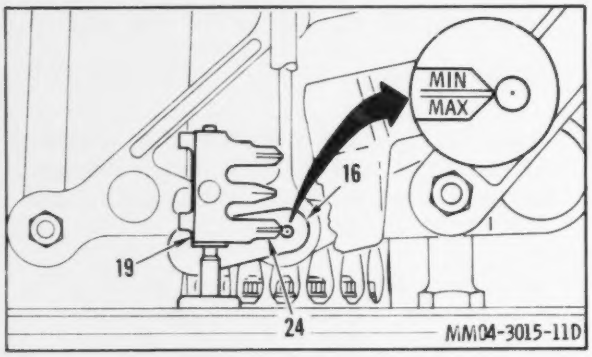
    b. If center point of alinement tool (16) falls between **MIN** and **MAX** marks on collective UP pointer (23), go to next step.



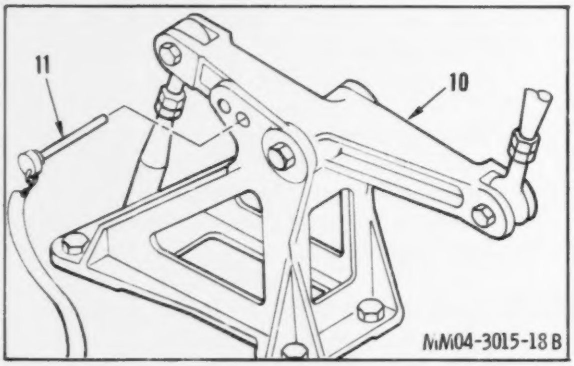
15. **Slowly push pilot collective stick (1) down until it stops.** Check that center point of alinement tool (16) alines with collective DOWN pointer (24) on rigging fixture (19).

    a. If center point of alinement tool (16) does not fall between **MIN** and **MAX** marks on collective DOWN pointer (24), check pilot and CPG collective stick stop rigging (para 11-6-4).

    b. If center point of alinement tool (16) falls between **MIN** and **MAX** marks on collective DOWN pointer (24), go to next step.



16. **Remove -5 rig pin (11) from lateral FS 165 bellcrank (10).**



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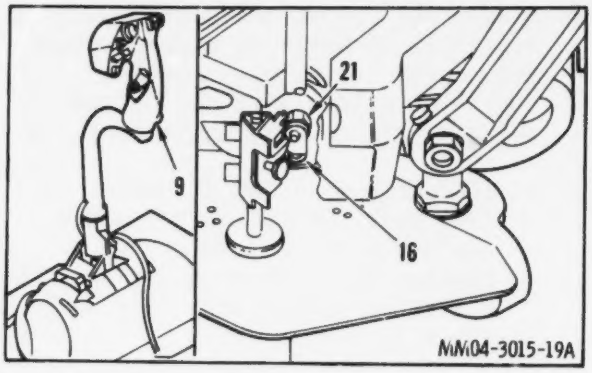
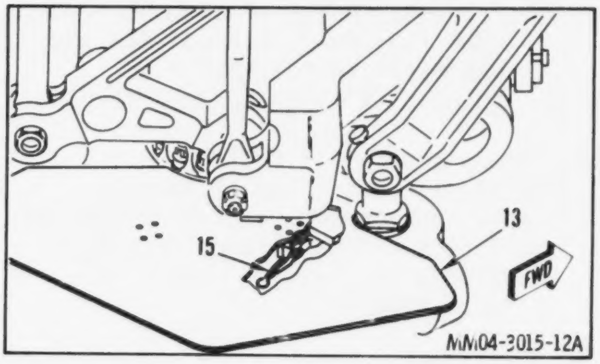
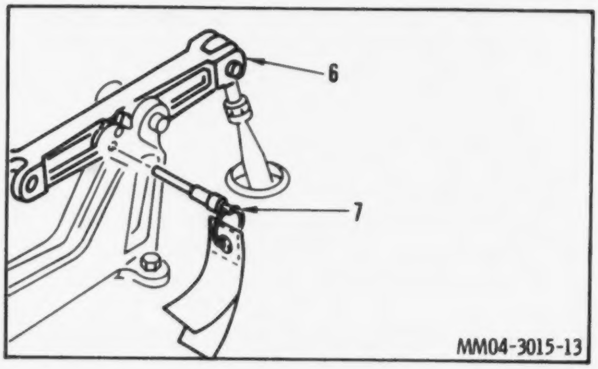
11-6-5. RIGGING COLLECTIVE UPPER FLIGHT CONTROLS (cont) 11-6-5







17. **Remove alinement tool (16) from forward bolt head (21) of aft longitudinal bellcrank (22) by deflecting cyclic stick (9) full left.**

18. **Remove main rotor rigging plate (13).**

    a. Unfasten clamps (15).

    b. Remove plate (13).

19. **Remove -5 rig pin (7) at longitudinal FS 165 bellcrank (6).**

20. **Inspect (TI).**

21. **Check collective controls for freedom of movement and 0.0625-inch clearance between control rod, bellcranks, and structure.**

    a. Slowly move collective stick to full up, check for freedom of movement, and clearance of 0.0625-inch between control rods and bellcranks and structure. If clearance is not 0.0625-inch go back to step 14a.

    b. Slowly move collective stick to full down, check for freedom of movement and clearance of 0.0625-inch between control rods and bellcranks and structure.

22. **Perform collective flight control rigging operational check (TM 55-1520-238-T).**

23. **Install collective stick cover (para 11-3-54).**

24. **Disconnect external hydraulic power (para 1-7-18).**

25. **Secure access covers R200 and L200 (para 2-2-2).**

END OF TASK

11-6-6. RIGGING LONGITUDINAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICKS 11-6-6

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
11-3-2	CPG cyclic stick cover removed
2-2-2	Access panels R200 and L200 removed
TM 9-1090-208-23	Area weapon removed

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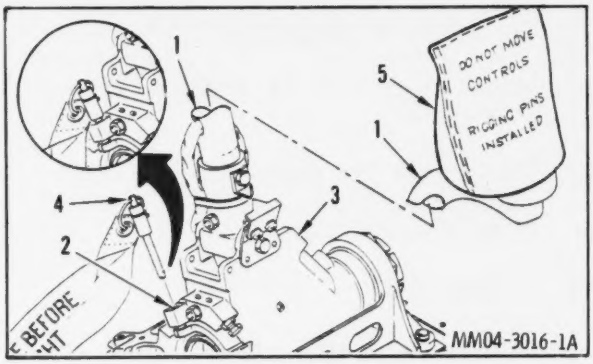
1. **Disconnect FS 165 push-pull rod from longitudinal servocylinder input lever** (para 7-2-48).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
3. **Slowly move pilot cyclic stick (1) to aline longitudinal rig pin holes (2) in cyclic stick base (3).**
4. **Install -9 rig pin (4) in rig pin hole (2) in cyclic stick base (3).**
5. **Install cyclic stick warning cover (5).**
6. **Install -9 rig pin (6) in rig pin holes of FS 97 bellcrank (7) and bracket (8).**
   - a. If rig pin (6) cannot be installed, adjust aft end of FS 97 push-pull rod (9) to aline rig pin holes (para 11-2-2).
   - b. Install -9 rig pin (6).



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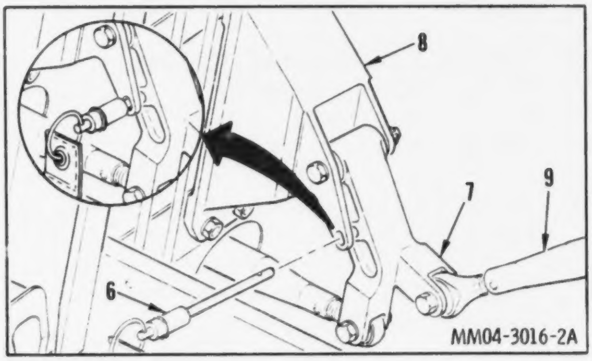

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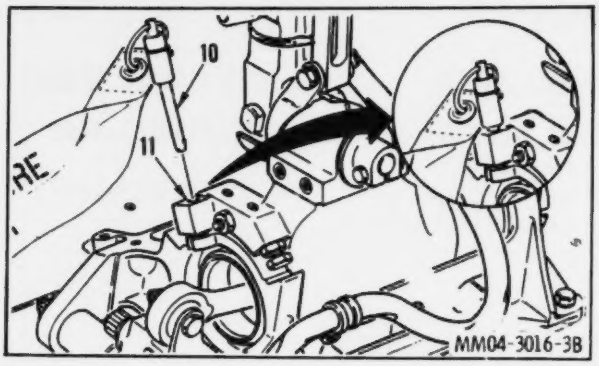
11-6-6. RIGGING LONGITUDINAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICKS (cont) 11-6-6

7. **Install -9 rig pin (10) in rig pin holes in CPG cyclic stick base (11).**
   a. If rig pin (10) cannot be installed adjust forward end of FS 83 push-pull rod (12) to aline rig pin holes (para 11-2-2). Remove cover B85R (para 2-2-2).
   b. Install -9 rig pin (10).
8. **Remove -9 rig pin (10) from CPG cyclic stick base (11).**
9. **Remove -9 rig pin (6) from FS 97 bellcrank (7) and bracket (8).**
10. **Remove -9 rig pin (4) from pilot cyclic stick base (3).**
11. **Remove cyclic stick warning cover (5).**
12. **Connect FS 165 push-pull rod to longitudinal servocylinder input** lever (para 7-2-49).
13. **Inspect (TI).**
14. **Secure cover B85R** (para 2-2-2) if **removed.**
15. **Perform longitudinal (cyclic) flight control rigging operational check** (TM 55-1520-238-T).
16. **Install pilot cyclic stick cover** (para 11-3-28).
17. **Install CPG cyclic stick cover** (para 11-3-2).
18. **Secure access panels R200 and L200** (para 2-2-2).
19. **Install area weapon** (TM 9-1090-208-23).

END OF TASK



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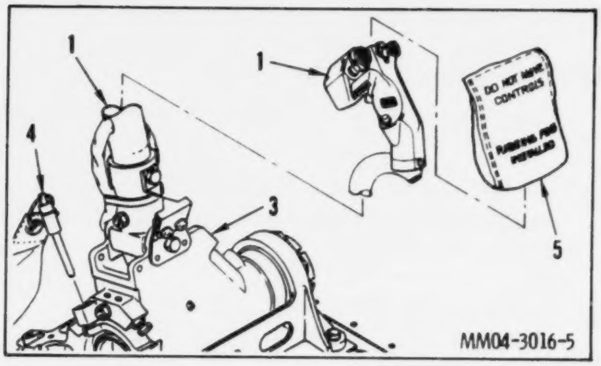

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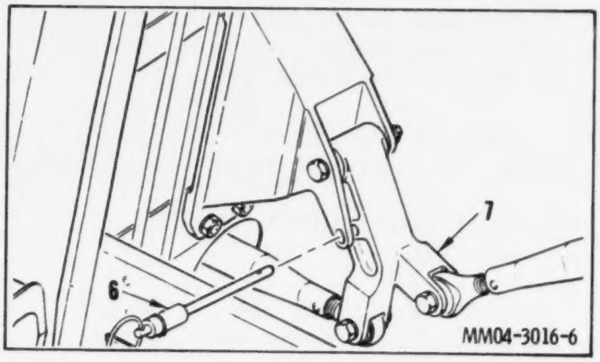

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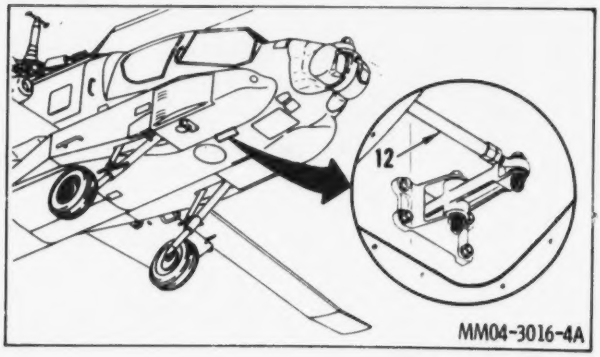


MM04-3016-4A

11-6-7. RIGGING LONGITUDINAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LONGITUDINAL SERVOCYLINDER 11-6-7

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
2-2-2	Access panels R200 and L200 removed
11-6-6	Longitudinal flight controls between pilot and CPG cyclic sticks rigged

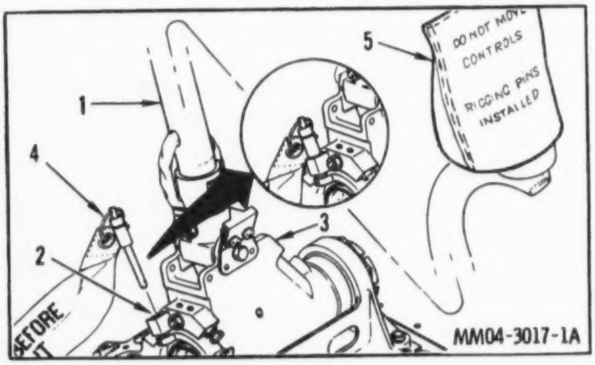
WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. **Disconnect FS 165 push-pull rod from longitudinal servocylinder input lever** (para 7-2-48).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
3. **Slowly move pilot cyclic stick (1) to aline longitudinal rig pin holes (2) in cyclic stick base (3).**
4. **Install -9 rig pin (4) in to rig pin hole (2) in cyclic stick base (3).**
5. **Install cyclic stick warning cover (5).**



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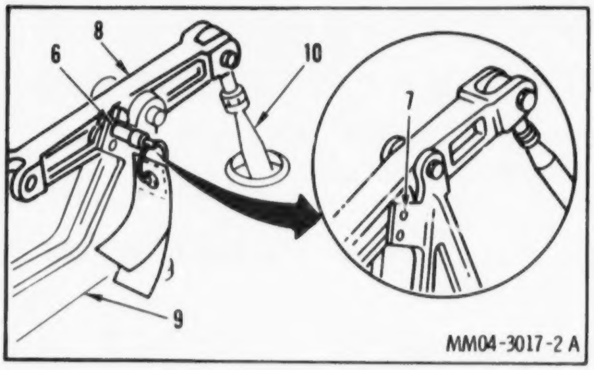
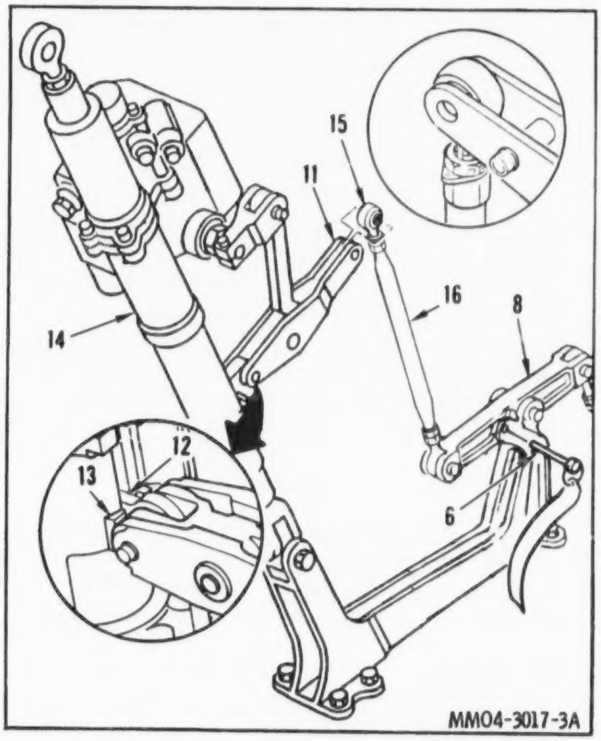
11-6-7. RIGGING LONGITUDINAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LONGITUDINAL SEROVCYLINDER (cont) 11-6-7



MM04-3017-2 A

6. **Install -9 rig pin (6) in midstroke rig pin hole (7) in longitudinal FS 165 bellcrank (8) and bracket (9).**
   a. If rig pin (6) cannot be installed, adjust top end of FS 160 push-pull rod (10) to aline rig pin holes (7) (para 11-2-2).
   b. Install -9 rig pin (6).

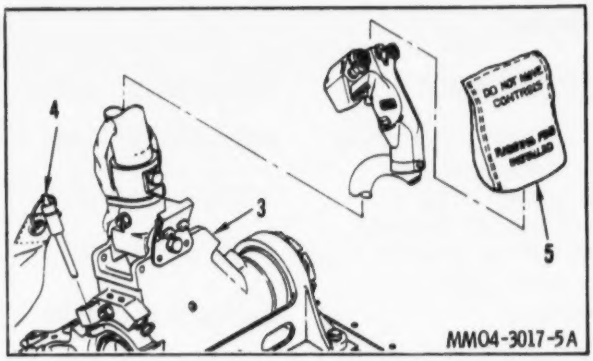


MM04-3017-3A

7. **Connect primary hydraulic external power** (para 1-7-18).
8. **Slowly move longitudinal servocylinder input lever (11) to aline lower lever (12) with upper edge of boss (13) on servocylinder body (14).**
9. **Check that holes in input lever (11) aline with FS 165 push-pull rod end (15).**
   a. If holes in input lever (11) do not aline with rod end (15), adjust upper end of FS 165 push-pull rod (16) to aline holes (para 11-2-2).
   b. If holes in input lever (11) aline with rod end (15) go to next step.
10. **Connect FS 165 push-pull rod (16) to input lever (11)** (para 7-2-49).
11. **Remove -9 rig pin (6) from FS 165 longitudinal bellcrank (8).**
12. **Inspect (TI).**

GO TO NEXT PAGE

11-6-7. RIGGING LONGITUDINAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LONGITUDINAL SEROVCYLINDER (cont) 11-6-7


4
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DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
MM04-3017-5A

13. **Remove -9 rig pin (4) from pilot cyclic stick base (3).**

14. **Inspect (TI).**

15. **Perform longitudinal flight control rigging operational check** (TM 55-1520-238-T).

16. **Remove cyclic stick warning covers (5).**

17. **Install pilot cyclic stick cover** (para 11-3-28).

18. **Disconnect hydraulic external power** (para 1-7-18).

19. **Secure access covers R200 and L200** (para 2-2-2).

END OF TASK

11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS 11-6-8

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879
Headset, Microphone (2)	5965-00-755-4656
Cord Assembly, Electrical, Maintenance-Headset	5995-01-163-9549
Caliper, Vernier	5210-00-234-8017

Materials/Parts:

(E81) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One person to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers R200 and L200 removed
1-7-18	External primary hydraulic power connected
11-3-27	Pilot cyclic stick cover removed
11-3-2	CPG cyclic stick cover removed
11-6-6	Longitudinal flight controls between pilot and CPG cyclic stick rigged
11-6-7	Longitudinal flight controls between pilot cyclic stick and longitudinal servocylinder rigged
TM 55-1520-238-T	ICS connected

GO TO NEXT PAGE

11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

WARNING

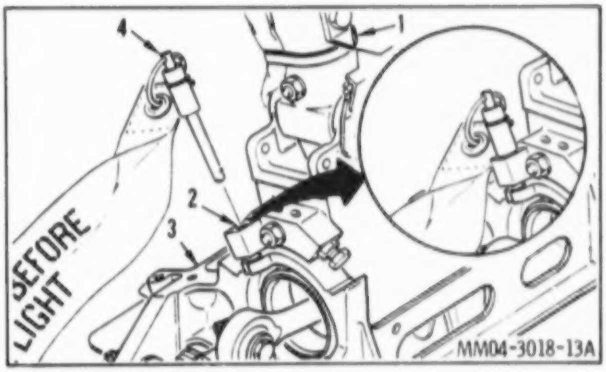
Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. Enter pilot station (para 1-7-1). Observe all safety precautions.

2. Slowly move pilot cyclic stick (1) to aline longitudinal rig pin holes (2) in cyclic stick base (3). Install -9 rig pin (4).

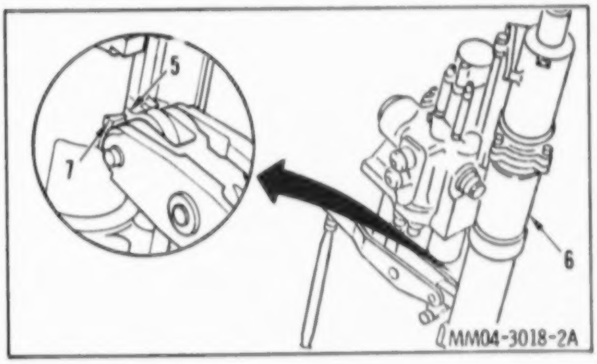


MM04-3018-13A

3. Check that lower lever (5) on longitudinal servocylinder (6) is alined with upper edge of boss (7) on servocylinder (6).

   a. If lower lever (5) is not alined with upper edge of boss (7) rig longitudinal controls between pilot stick and longitudinal servocylinder (para 11-6-7).

   b. If lower lever (5) is alined with upper edge of boss (7), go to next step.



MM04-3018-2A

GO TO NEXT PAGE

11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

4. **Measure distance between valve arm (8) and stop bolt (9) on servocylinder (6).** This is measurement A. Use caliper.

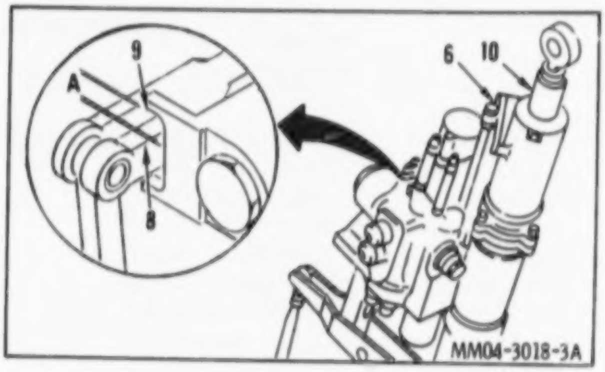
5. **Remove -9 rig pin (4) from base (3).**

6. **Back off pilot forward cyclic limit stop bolt (9) and aft limit stop bolt (11).**

   a. Cut and remove lockwire (12).

   b. Loosen locknut (13) and turn bolt (10) and bolt (11) into base (3).

7. **Do step 6 for CPG bolt (10) and bolt (11).**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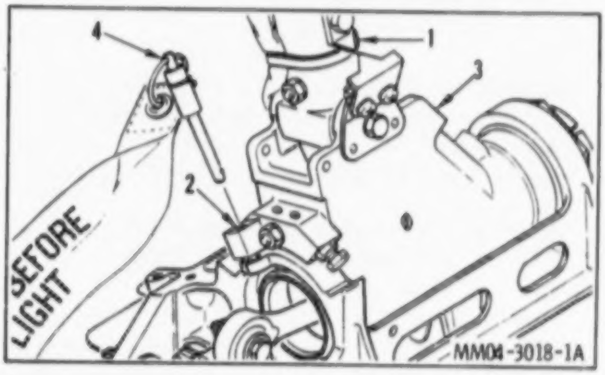
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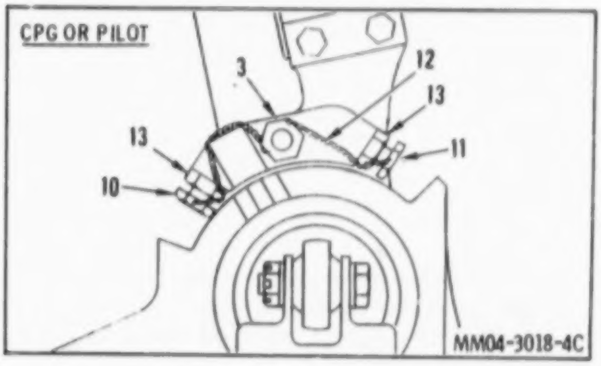
MM04-3018-1A


CPG OR PILOT
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MM04-3018-4C

GO TO NEXT PAGE

11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

8. **Observe longitudinal servocylinder (6) piston (14) travel.**

9. **Fully retract piston by slowly pushing forward on stick (1).**

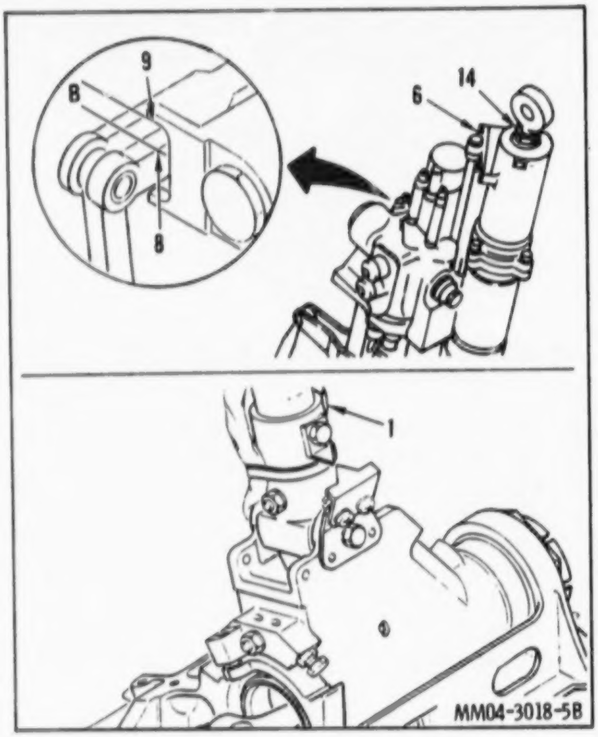
   a. Slowly push forward on stick (1) until piston (14) is fully retracted.

   b. Hold stick (1) in this position.

10. **Measure distance between valve arm (8) and stop bolt (9) on servocylinder (6).** This is measurement B. The difference between measurements A and B must be less than **0.030 inch.** Use caliper.

    a. If difference between measurement A and B is more than **0.030 inch** pull cyclic stick (1) slowly aft until difference between measurement and measurement B is less than **0.030 inch.**

    b. Hold stick (1) in this position.



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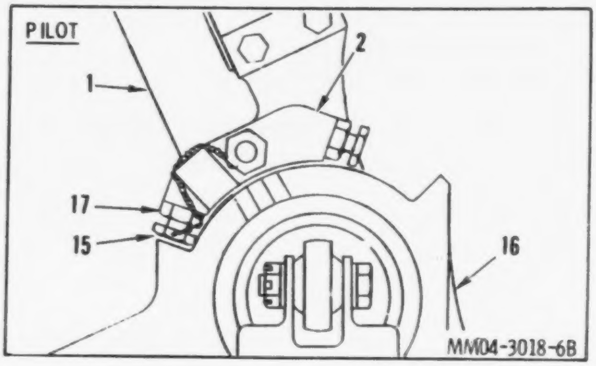
11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

11. **Adjust pilot cyclic stick forward limit stop bolt (15) to contact housing (16).**

    a. Turn stop bolt (15) counterclockwise until it contacts housing (16).

    b. Hold stop bolt (15). Tighten locknut (17).

    c. Lockwire stop bolt (15) and locknut (17). Use lockwire (E81).



12. **Hold pilot cyclic stick (1) against forward stop (15).** Adjust CPG forward stop bolt (18) to contact 0.020-inch thickness gage (19) held between CPG cyclic housing (20) and forward stop bolt (18).

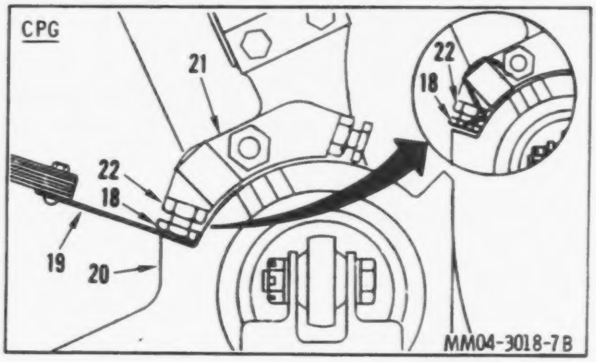
    a. Hold stick (1) against bolt (15).

    b. Hold gage (19) against CPG cyclic housing (20).

    c. Turn stop bolt (18) out of CPG base (21) until it contacts gage (19) against housing (20).

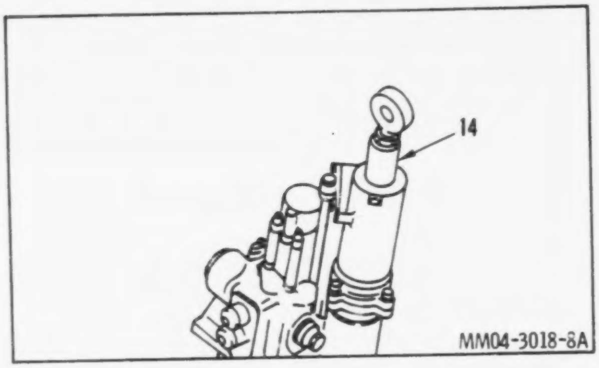
    d. Hold bolt (18). Tighten locknut (22).

    e. Lockwire bolt (18) to locknut (22). Use lockwire (E81).



11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

13. Observe longitudinal servocylinder piston (14) travel.

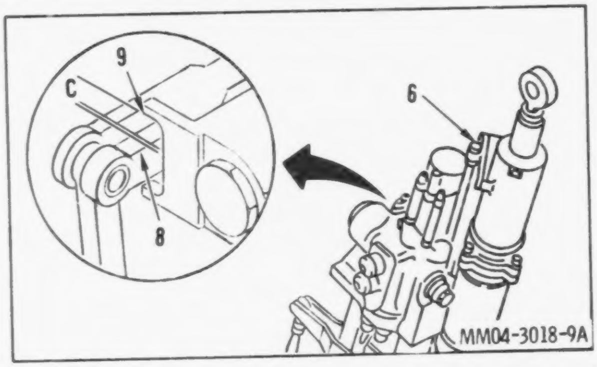


14. Fully extend piston (14) by slowly pulling aft on pilot cyclic stick (1).

a. Slowly pull aft on stick (1) until piston (14) is fully extended.

b. Hold stick (1) in this position.

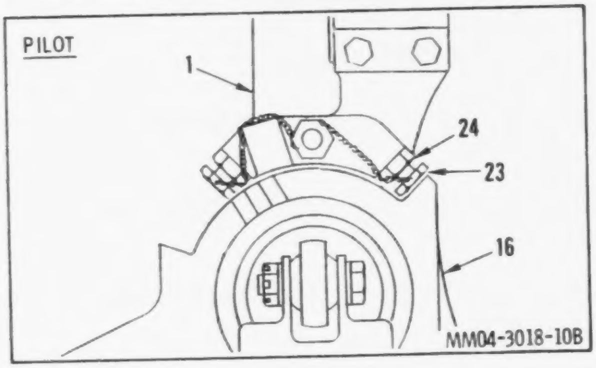
15. Measure distance between arm (8) and bolt (9) on servocylinder (6). This is measurement C. Difference between measurement A and C must be less than **0.030 inch.** Use caliper.



a. If difference between measurements A and C is more than **0.030 inch** move stick (1) slowly forward until difference between measurement A measurement C is less than **0.030 inch.**

b. Hold stick in this position. Go to next step.

16. Adjust bolt (23) to contact housing (16).



a. Turn bolt (23) counterclockwise until it contacts housing (16).

b. Hold bolt (23). Tighten locknut (24).

c. Lockwire bolt (23) to locknut (24). Use lockwire (E81).

GO TO NEXT PAGE

11-6-8. RIGGING PILOT AND CPG LONGITUDINAL CYCLIC STICK STOP BOLTS (cont) 11-6-8

17. **Hold pilot cyclic stick (1) against aft stop bolt (23).** Adjust CPG cyclic stick aft stop bolt (25) to contact gage (19) held between CPG housing (20) and bolt (25).

    a. Hold pilot stick (1) against bolt (21).

    b. Hold gage (19) against CPG housing (20).

    c. Rotate aft stop bolt (25) counterclockwise until it contacts gage (19) against housing (20).

    d. Hold bolt (25). Tighten locknut (26).

    e. Lockwire stop bolt (25) to locknut (26).

18. **Inspect (TI).**

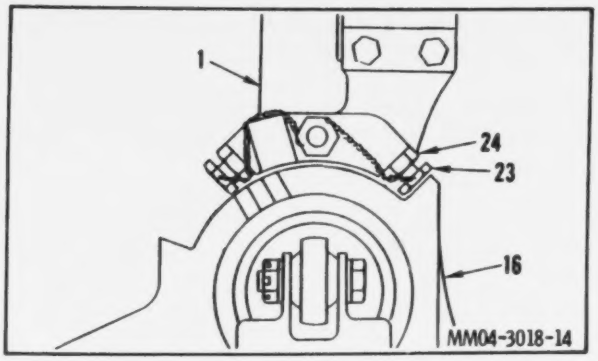
19. **Perform longitudinal (cyclic) flight control rigging operational check** (TM 55-1520-238-T).

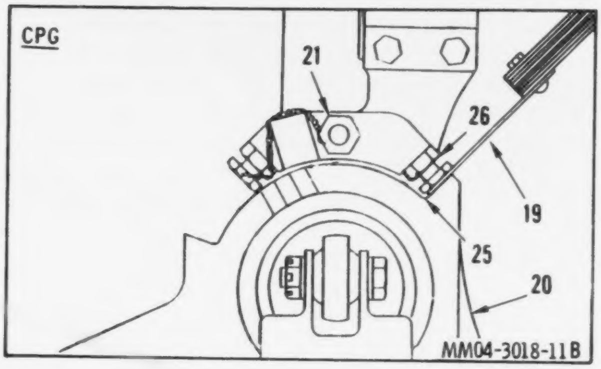
20. **Disconnect external hydraulic power** (para 1-7-18).

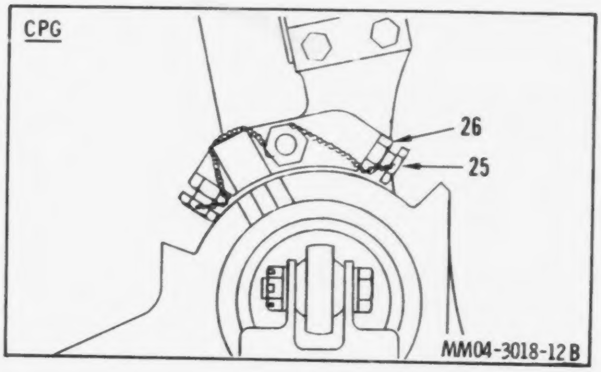
21. **Install pilot cyclic stick cover** (para 11-3-28).

22. **Install CPG cyclic stick cover** (para 11-3-2).

23. **Secure panels R20 and L200** (para 2-2-2).







END OF TASK

11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS 11-6-9

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Materials/Parts:

(E81) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers L200 and R200 removed
1-7-18	External primary hydraulic power connected
11-6-6	Longitudinal flight controls between pilot and CPG cyclic stick rigged
11-6-7	Longitudinal flight controls between pilot cyclic stick and longitudinal servocylinder rigged
11-6-8	Pilot and CPG cyclic stick stop bolts rigged

GO TO NEXT PAGE

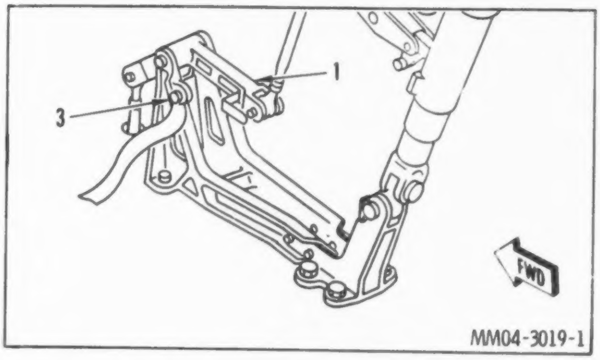
WARNING

- **Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.**
- **To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.**

CAUTION

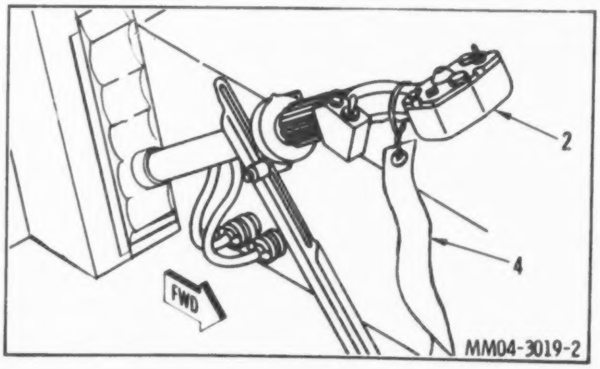
To prevent damage to flight control system components, do not use force if binding or roughness occur while moving controls with hydraulic power.

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Observe the collective FS 165 bellcrank (1).**



MM04-3019-1

3. **Move collective stick (2) slowly until rig pin holes in FS 165 bellcrank (1) are alined.** Install -9 rig pin (3). Install collective stick warning flags (4).



MM04-3019-2

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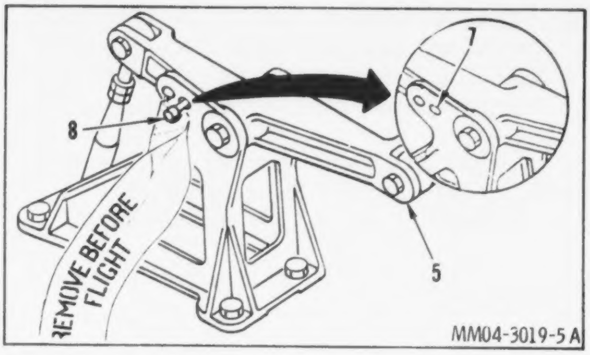
11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS (cont) 11-6-9

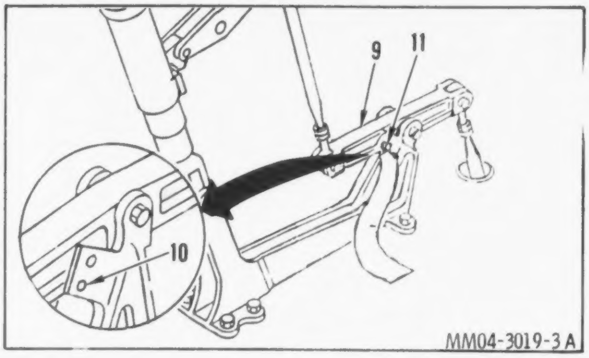
4. **Observe lateral FS 165 bellcrank (5).**

5. **Move pilot cyclic stick (6) slowly until rig pin holes in lateral FS 165 bellcrank (5), at level swashplate position (7), are alined.** Install -5 rig pin (8).


7
8
REMOVE BEFORE FLIGHT
5
MM04-3019-5 A

6. **Observe longitudinal FS 165 bellcrank (9).**

7. **Move pilot cyclic stick (6) slowly until rig pin holes in longitudinal FS 165 bellcrank (9), at level swashplate position (10), are alined.** Install -5 rig pin (11).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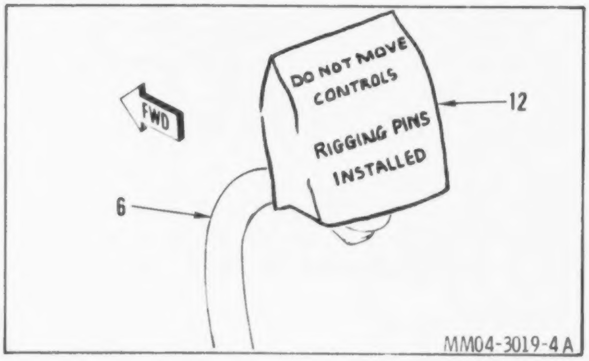
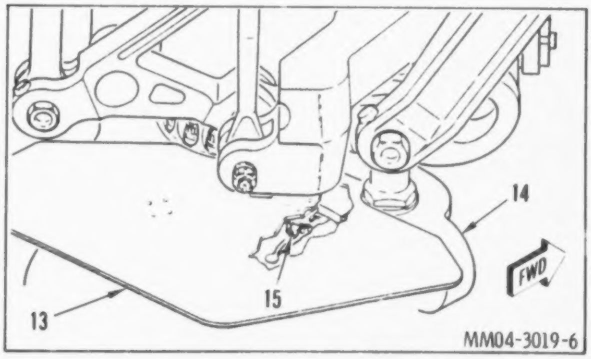
MM04-3019-3 A

8. Install cyclic stick **warning** covers (12).


FWD
DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
12
6
MM04-3019-4 A

9. Install **main** rotor rigging plate (13) on **mast** base (14).
   a. Place rigging plate (13) on top right side of mast base (14).
   b. Fasten clamps (15) under rigging plate (13).


14
FWD
15
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MM04-3019-6

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11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS (cont) 11-6-9

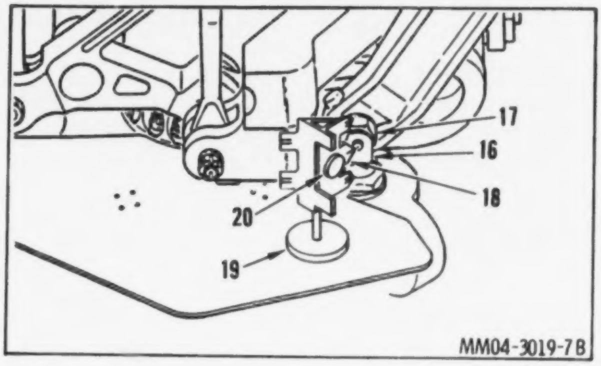
10. **Place alinement tool (16) into head of mixer support bolt (17).** Adjust BASIC DIM pointer (18) to aline with center point of alinement tool (16).

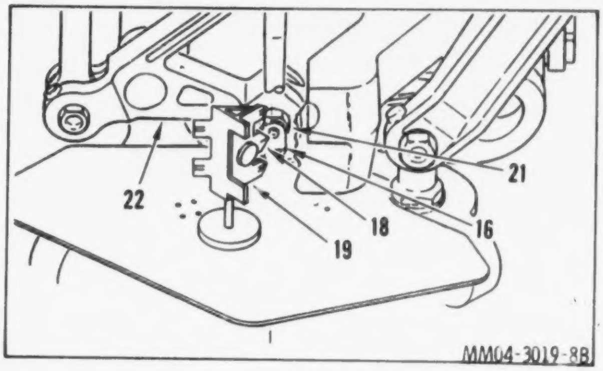
    a. Install large end of alinement tool (16) in head of mixer support bolt (17) and hold.

    b. Place rigging fixture (19) next to alinement tool (16).

    c. Loosen thumbscrew (20) and aline BASIC DIM pointer (18) with center point of alinement tool (16).

    d. Tighten thumbscrew (20).





11. **Install alinement tool (16) in forward bolt head (21) of aft longitudinal bellcrank (22).** Check that BASIC DIM pointer (18) alines with center point of alinement tool (16).

    a. If BASIC DIM pointer (18) does not aline with center point of alinement tool (16), rig upper collective flight controls (para 11-6-5).

    b. If BASIC DIM pointer (18) alines with center point of alinement tool (16), go to next step.

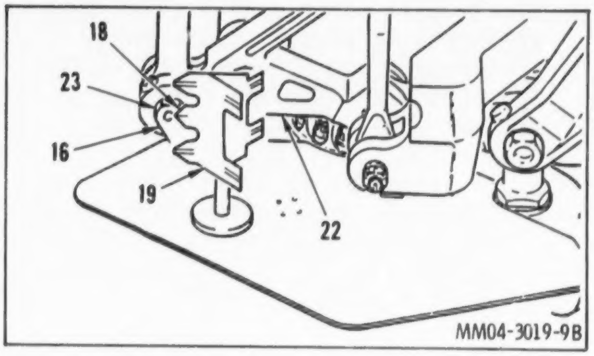
GO TO NEXT PAGE

11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS (cont) 11-6-9

12. **Install alinement tool (16) in aft bolt head (23) of aft longitudinal bellcrank (22).** Check that BASIC DIM pointer (18) alines with center point of alinement tool (16).

    a. If BASIC DIM pointer (18) does not aline with center point of alinement tool (16), adjust longitudinal servocylinder rod end (para 11-6-18).

    b. If BASIC DIM pointer (18) does aline with center point of alinement tool (16), go to next step.

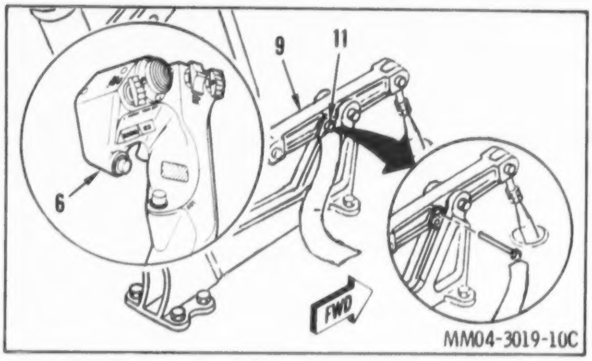


MM04-3019-9B

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

13. **Remove -5 rig pin (11) from longitudinal FS 165 bellcrank (9).**

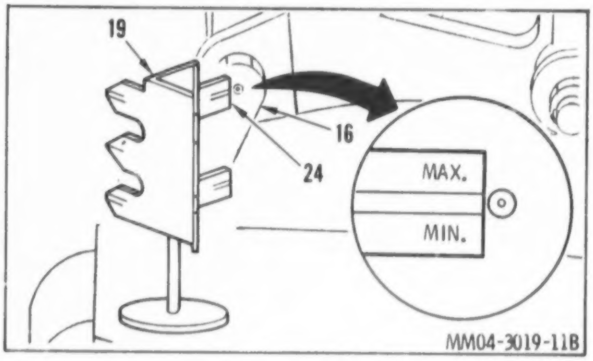


MM04-3019-10C

14. **Slowly push pilot cyclic stick (6) forward until it stops.** Check that center point of alinement tool (16) is between **MIN** and **MAX** marks on cyclic **FWD** pointer (24).

    a. If center point of alinement tool (16) is not between **MIN** and **MAX** mark on **FWD** pointer (24), adjust pilot and CPG cyclic stick stops (para 11-6-8).

    b. If center point of alinement tool (16) is between **MIN** and **MAX** marks on **FWD** pointer (24), go to next step.



MM04-3019-11B

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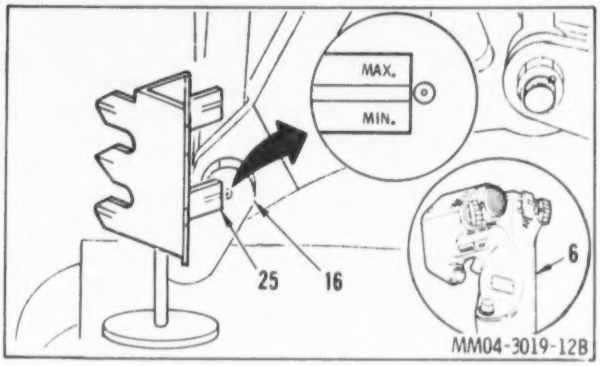
11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS (cont) 11-6-9

15. **Slowly pull pilot cyclic stick (6) aft until it stops.** Check that center point of alinement tool (16) is between **MIN** and **MAX** marks on **AFT** pointer (25).

    a. If center point of alinement tool (16) is not between **MIN** and **MAX** marks on **AFT** pointer (25), adjust pilot cyclic stick stops (para 11-6-8).

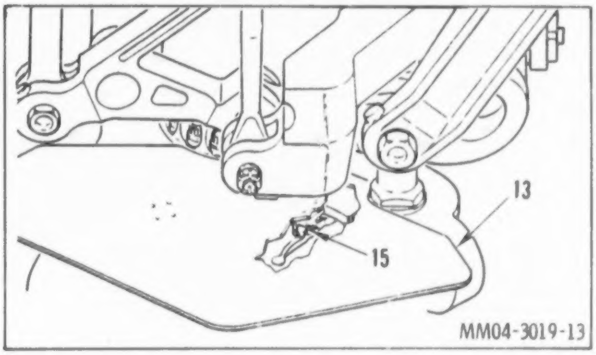
    b. If center point of alinement tool (16) is between **MIN** and **MAX** marks on **AFT** pointer (25), go to next step.


MAX.
MIN.
25
16
6
MM04-3019-12B

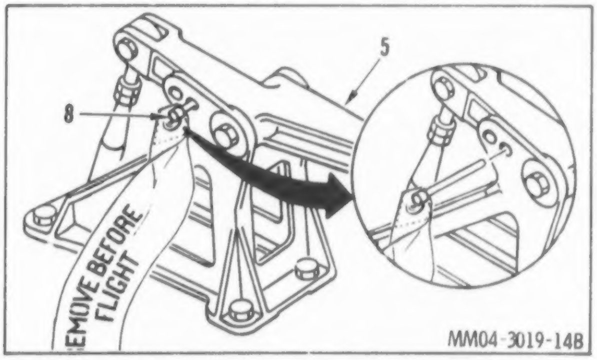
16. **Remove main rotor rigging plate (13).**

    a. Unfasten clamps (15).

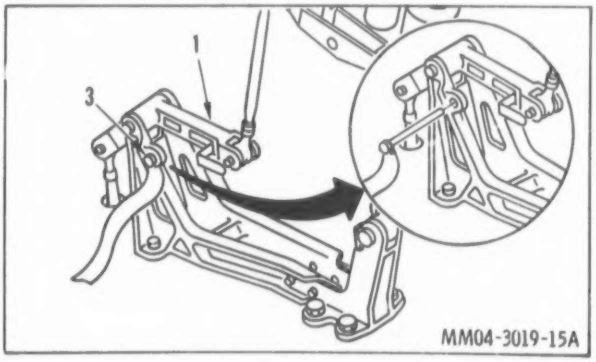
    b. Remove plate (13).


13
15
MM04-3019-13

17. **Remove -5 rig pin (8) from lateral FS 165 bellcrank (5).**


5
8
EMOVE BEFORE FLIGHT
MM04-3019-14B

18. **Remove -9 rig pin (3) from collective FS 165 bellcrank (1).**


1
3
MM04-3019-15A

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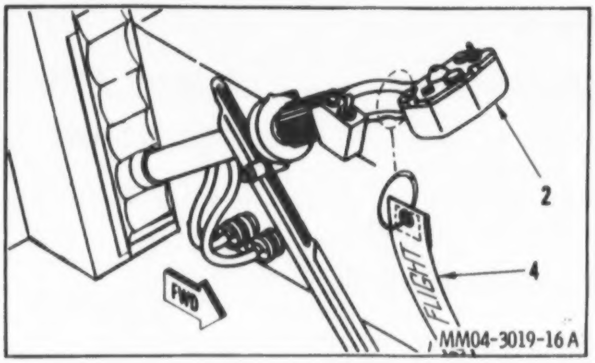
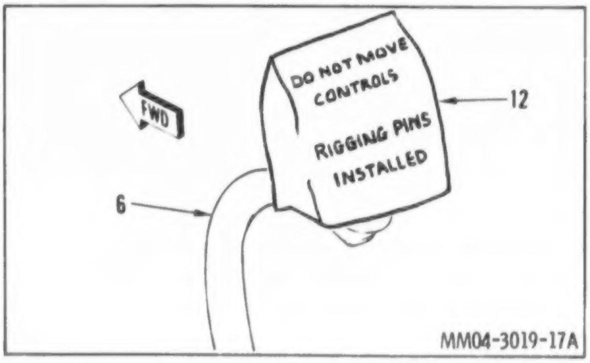
11-6-9. RIGGING UPPER LONGITUDINAL FLIGHT CONTROLS (cont) 11-6-9


2
4
FWD
FLIGHT
MM04-3019-16 A


FWD
DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
12
6
MM04-3019-17A

19. **Remove collective stick warning flags (4) from collective sticks (2) and cyclic stick warning covers (12) from cyclic sticks (6).**

20. **Check longitudinal controls for freedom of movement and 0.0625-inch clearance between control rods and bellcranks and structure.**

    a. Slowly move cyclic stick full forward, check for freedom of movement and **0.0625-inch** clearance between control rods and bellcranks and structure. If clearance is not 0.0625-inch go back to step 15a.

    b. Slowly move cyclic stick full aft, check for freedom of movement and **0.0625-inch** clearance between control rods and bellcranks and structure.

21. **Disconnect primary hydraulic external power** (para 1-7-18).

22. Inspect (TI).

23. **Secure access panels R200 and L200** (para 2-2-2).

END OF TASK

11-6-10. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICK 11-6-10

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-238-23

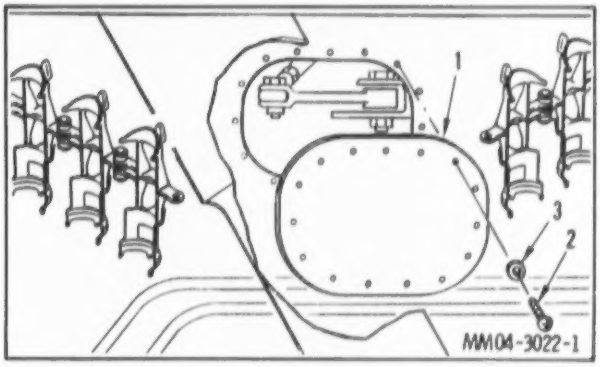
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
11-3-27	Pilot cyclic stick cover removed
11-3-2	CPG cyclic stick cover removed
TM 9-1090-208-23	Area weapon turret removed. Ammunition conveyor just forward of left main landing gear leg disconnected

---

1. **Remove lateral decoupler access door (1).** Remove 15 screws (2), washers (3), and door (1).

2. **Disconnect FS 165 push-pull rod from lateral servocylinder input lever** (para 7-2-45).



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11-6-10. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICK (cont) 11-6-10

3. **Enter pilot station (para 1-7-1). Observe all safety precautions.**

4. **Slowly move pilot cyclic stick (4) to aline lateral ring pin holes (5) in cyclic stick support (6).**

5. **Install -5 rig pin (7) into rig pin holes (5) in pilot cyclic stick support (6).** Install cyclic stick warning covers (8).

6. **Install -9 rig pin (9) in rig pin holes (10) of lateral FS 133 bellcrank (11) and bracket (12).**

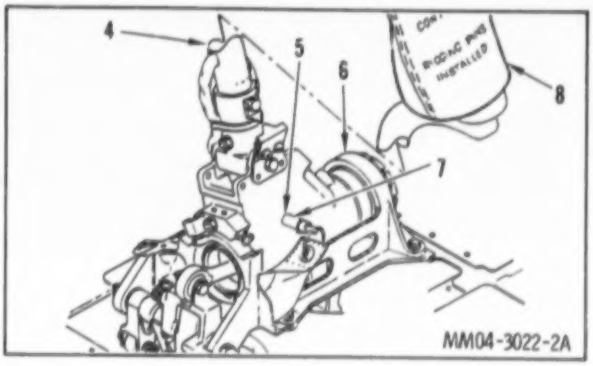
   a. If rig pin (9) cannot be installed, adjust aft end of lateral FS 133 push-pull rod (13) to aline rig pin holes (10) (para 11-2-2).

   b. Install -9 rig pin (9).

7. **Install -9 rig pin (14) in rig pin holes of lateral FS 111 bellcrank (15) and bracket (16).**

   a. If rig pin (14) cannot be installed, adjust forward end of FS 111 push-pull rod (17) to aline rig pin holes (18) (para 11-2-2).

   b. Install -9 rig pin (14).


4
5
6
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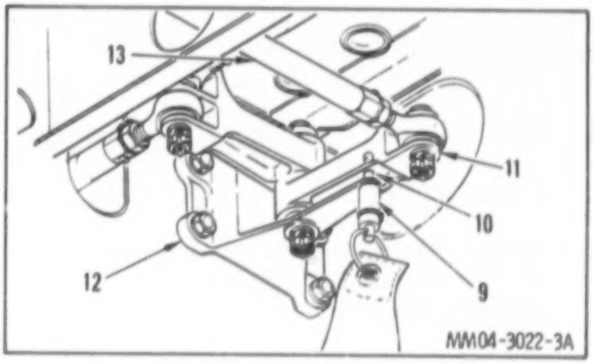
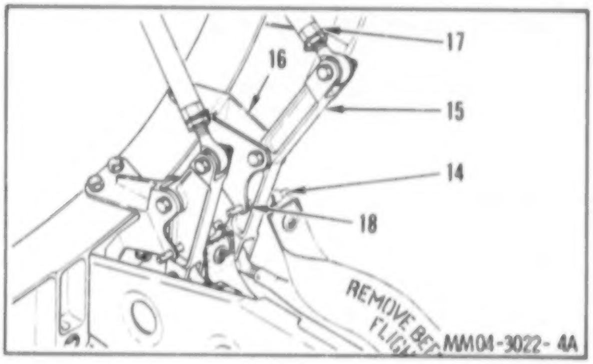
8
RIGGING PINS INSTALLED
MM04-3022-2A


13
11
10
12
9
MM04-3022-3A


17
16
15
14
18
REMOVE BEF
FLIG
MM04-3022- 4A

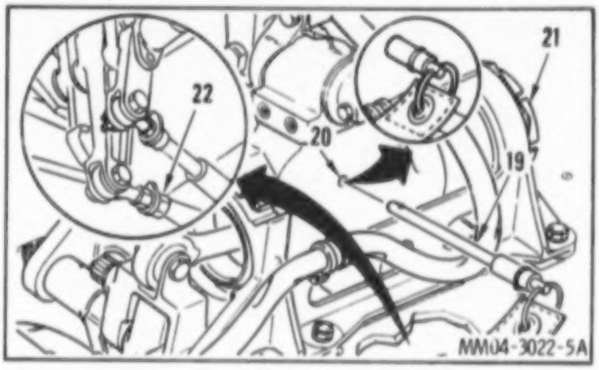
GO TO NEXT PAGE

11-6-10. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICK (cont) 11-6-10

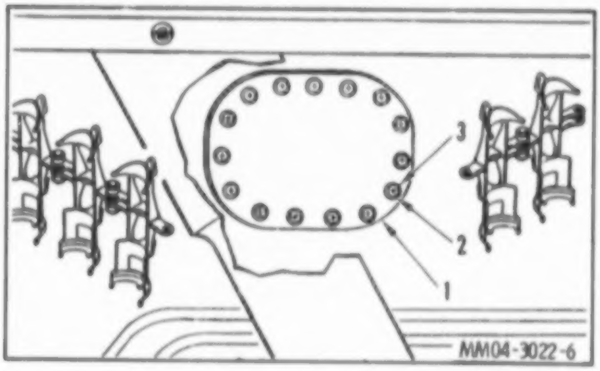
8. **Install -5 rig pin (19) into rig pin holes (20) in CPG cyclic stick support (21).**

   a. If rig pin (19) cannot be installed, adjust forward end of lateral FS 65 push-pull rod (22) to aline rig pin holes (20) (para 11-2-2). Remove access door B60 (para 2-2-2).

   b. Install -5 rig pin (19).



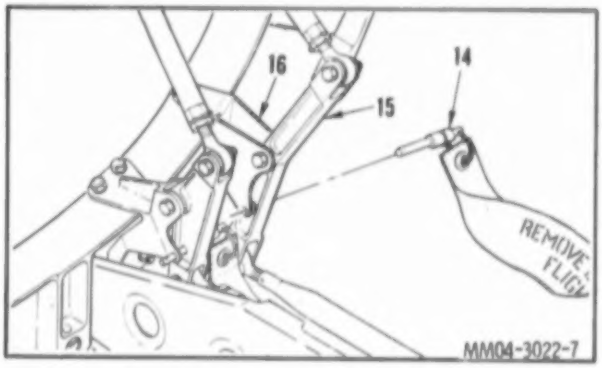
9. **Remove -5 rig pin (19) from CPG cyclic stick support (21).**



10. **Remove -9 rig pin (14) from lateral FS 111 bellcrank (15) and bracket (16).**

11. **Remove -9 rig pin (9) from lateral FS 133 bellcrank (11) and bracket (12).**

12. **Remove -5 rig pin (7) from pilot cyclic stick support (6).**



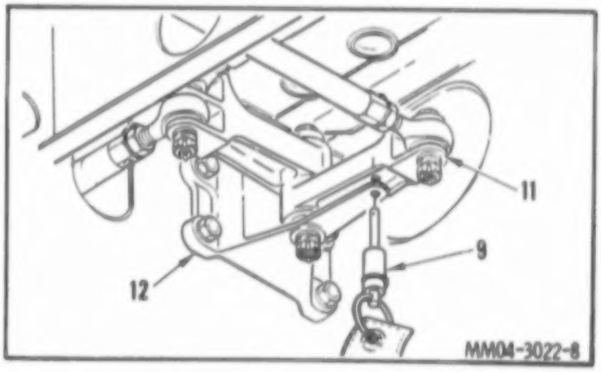
13. **Connect FS 165 push-pull rod to lateral servocylinder input lever** (para 7-2-46).

14. **Inspect (TI).**

15. **Perform lateral (cyclic) flight control rigging operational check** (TM 55-1520-238-T).

16. **Install pilot cyclic stick cover** (para 11-3-28).

17. **Install CPG cyclic stick cover** (para 11-3-2).



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11-6-10. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT AND CPG CYCLIC STICK (cont) 11-6-10

18. Install lateral decoupler access door (1). Install 15 washers (3) and screws (2).

19. Inspect (TI).

20. Install area weapon turret (TM 9-1090-208-23).

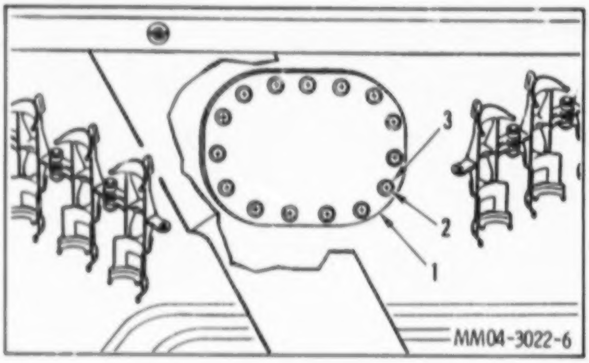
21. Reconnect ammunition conveyor (TM 9-1090-208-23).

22. Perform area weapon system operational check (TM 9-1090-208-23).

23. Inspect (TI).

24. Secure access door B60 (para 2-2-2), if removed.

25. Inspect (TI).



END OF TASK

11-6-11. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LATERAL SERVOCYLINDER 11-6-11

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879

Personnel Required:

67R10 Attack Helicopter Repairer (2) One to assist
66R30 Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers R200 and L200 removed
1-7-18	Primary external hydraulic power connected
11-3-27	Pilot cyclic stick cover removed
11-6-10	Lateral flight controls between pilot and CPG cyclic sticks rigged

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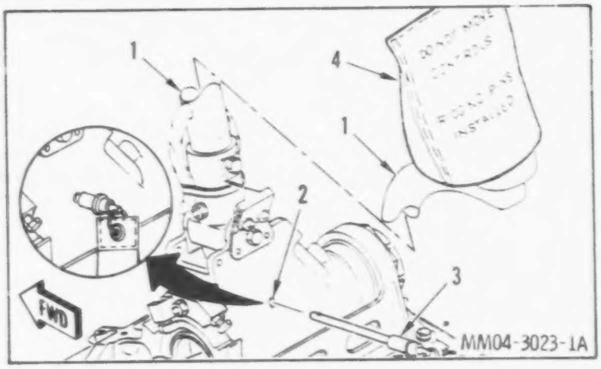
WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.



CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occur while moving controls with hydraulic power.

1. **Disconnect FS 165 push-pull rod from lateral servocylinder input lever** (para 7-2-45).
2. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
3. **Slowly move pilot cyclic stick (1) to aline lateral rig pin holes (2) in cyclic stick support.**
4. **Install -5 rig pin (3) in holes (2).**
5. **Install cyclic stick warning covers (4).**

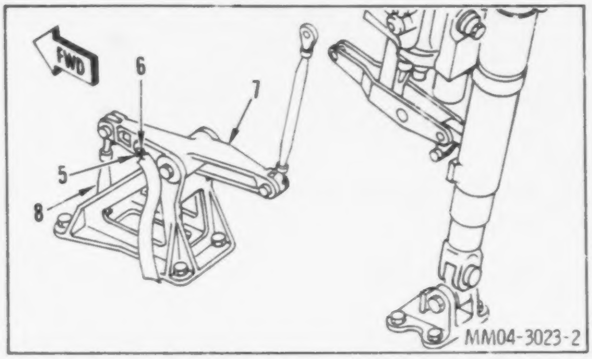
GO TO NEXT PAGE

11-6-11. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LATERAL SERVOCYLINDER (cont) 11-6-11

6. Install -9 rig pin (5) into midstroke rig pin holes (6) in lateral FS 165 bellcrank (7).

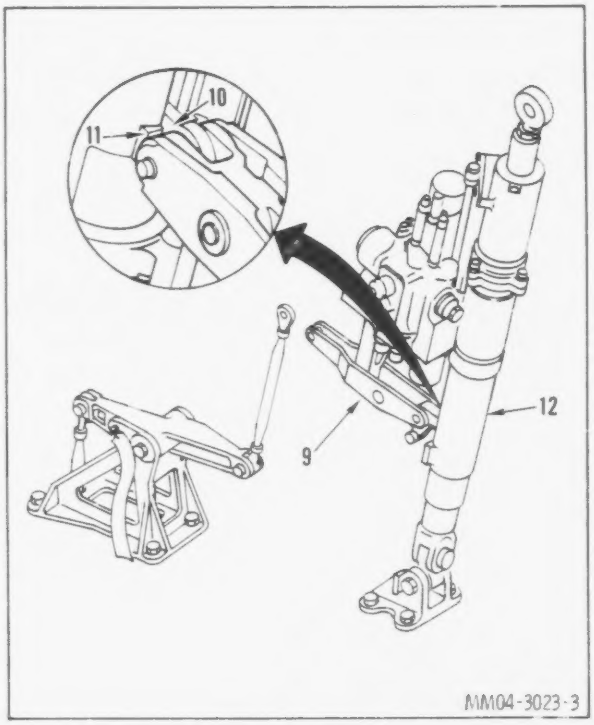
a. If pin (5) cannot be installed, adjust upper end of FS 159 push-pull rod (8) to aline holes (6) (para 11-2-2).

b. Install -9 rig pin (5).



MM04-3023-2

7. Slowly move lateral servocylinder input lever (9) to aline lower lever (10) with upper edge of boss (11) on servocylinder body (12).



MM04-3023-3

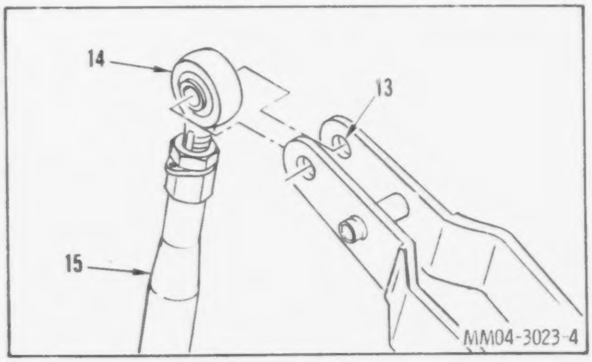
8. Check that holes (13) in input lever (9) aline with lateral FS 165 push-pull rod end (14).

a. If holes (13) do not aline with rod end (14) adjust rod end (14) of FS 165 push-pull rod (15) (para 11-2-2).

b. If holes (13) in input lever (9) aline with rod end (14), go to next step.

9. Connect FS 165 push-pull rod to input lever (para 7-2-46).

10. Inspect (TI).



MM04-3023-4

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11-6-11. RIGGING LATERAL FLIGHT CONTROLS BETWEEN PILOT CYCLIC STICK AND LATERAL SERVOCYLINDER (cont) 11-6-11

11. Remove -9 rig pin (5) from lateral FS 165 bellcrank (7).

12. Remove -5 rig pin (3) from pilot cyclic stick support (2).

13. Remove cyclic stick warning covers (4).

14. Inspect (TI).

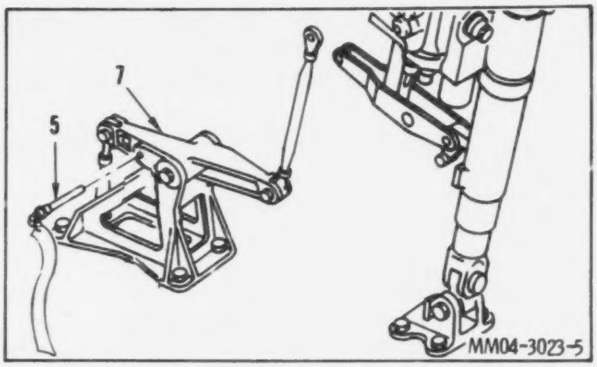
15. Perform lateral (cyclic) flight control rigging operational check (TM 55-1520-238-T).

16. Install pilot cyclic stick cover (para 11-3-28).

17. Inspect (TI).

18. Disconnect external hydraulic power (para 1-7-18).

19. Secure access covers R200 and L200 (para 2-2-2).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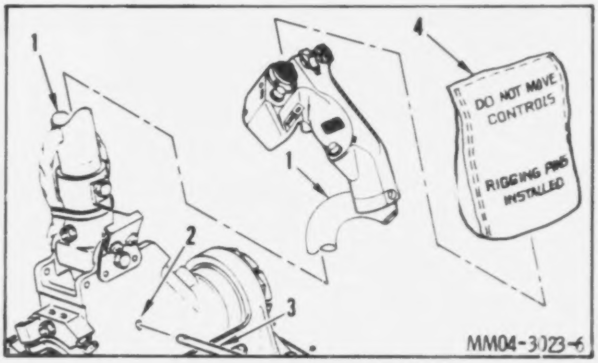
5
MM04-3023-5


1
4
DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
1
2
3
MM04-3023-6

END OF TASK

11-6-12. RIGGING PILOT AND CPG LATERAL CYCLIC STICK STOP BOLTS 11-6-12

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879
Headset-Microphone (2)	5965-00-755-4656
Cord Electrical-Maintenance Headset	5995-01-163-9549
Caliper, Vernier	5210-00-234-8017

Materials/Parts:

(E81) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

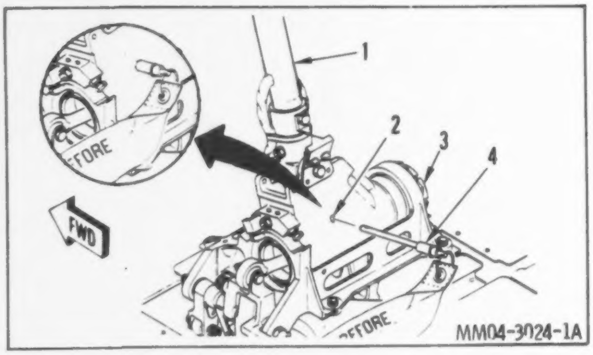
Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers R200 and L200 removed
1-7-18	External primary hydraulic power connected
11-3-27	Pilot cyclic stick cover removed
11-3-2	CPG cyclic stick cover removed
11-6-10	Lateral flight controls between pilot and CPG cyclic sticks rigged
11-6-11	Lateral flight controls between cyclic stick and lateral servocylinder rigged

TM 55-1520-238-T ICS connected

WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.



CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occur while moving controls with hydraulic power.

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Slowly move pilot cyclic stick (1) to aline lateral rig pin holes (2) in cyclic stick support (3).** Install -5 rig pin (4) in pilot cyclic stick support (3).

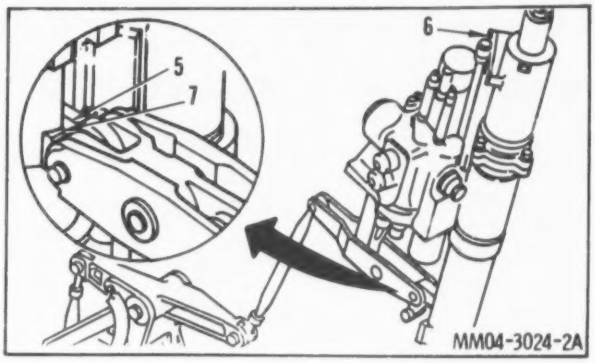
GO TO NEXT PAGE

11-6-12. RIGGING PILOT AND CPG LATERAL CYCLIC STICK STOP BOLTS (cont) 11-6-12

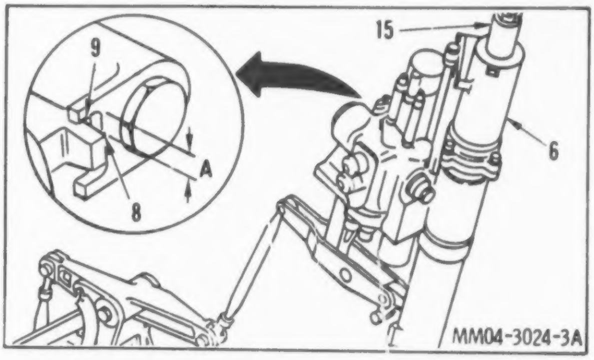
3. **Check that lower lever (5) on lateral servocylinder (6) is alined with upper edge of boss (7) on servocylinder body.**

   a. If lever (5) is not alined with upper edge of boss (7), rig lateral controls between pilot stick and lateral servocylinder (para 11-6-11).

   b. If lever (5) is alined with upper edge of boss (7), go to next step.



4. **Measure distance between valve arm (8) and stop bolt (9) on servocylinder (6).** This is measurement A. Use caliper.

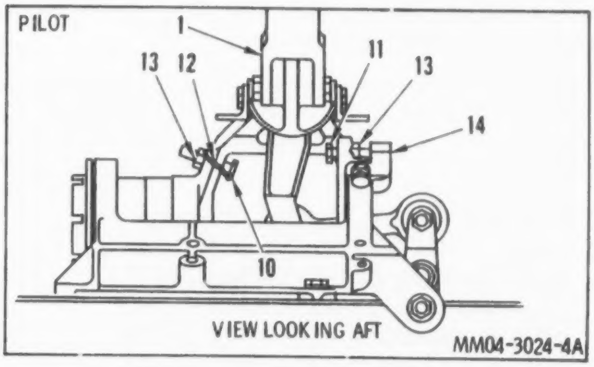


5. **Remove -5 rig pin (4) from pilot cyclic stick support (3).**

6. **Back off pilot cyclic stick (1) left limit stop bolt (10) and right limit stop bolt (11).**

   a. Remove lockwire (12).

   b. Loosen nuts (13). Turn stop bolts (10, 11) into housing (14).



7. **Perform step 6 for CPG left limit stop bolt and right limit stop bolt.**

8. **Observe servocylinder (6) piston (15) travel.**

9. **Fully retract piston (15) by slowly moving stick (1) left.**

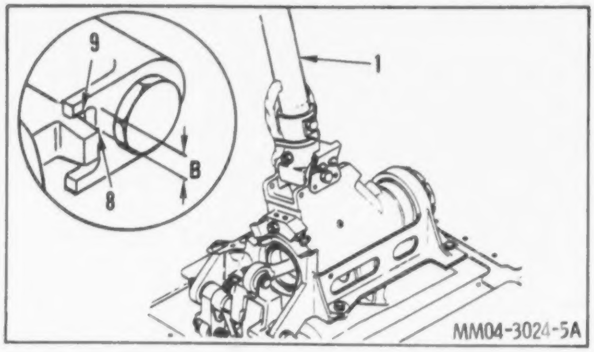
   a. Slowly push left on stick (1) until piston (15) is fully retracted.

   b. Hold stick (1) in this position.

GO TO NEXT PAGE

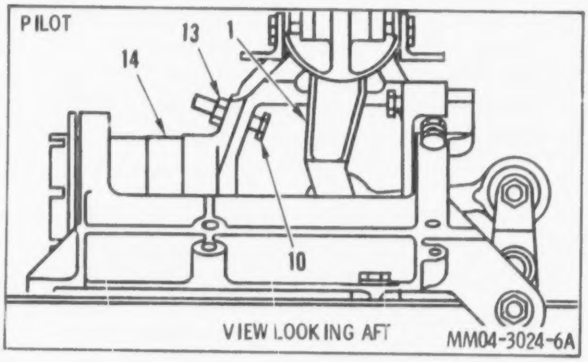
11-6-12. RIGGING PILOT AND CPG LATERAL CYCLIC STICK STOP BOLTS (cont) 11-6-12

10. **Measure distance between valve arm (8) and stop bolt (9) on lateral servocylinder (6).** This is measurement B. The difference between measurements A and B must be less than 0.030-inch. Use caliper.



   a. If difference between measurement A and B is more than 0.030-inch move cyclic stick (1) slowly right until difference between measurement A and measurement B is less than 0.030-inch.

   b. Hold stick in this position. Go to next step.

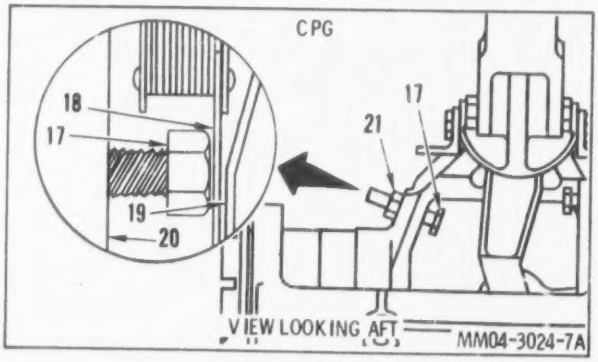


11. **Adjust pilot left limit stop bolt (10) to contact stick (1).**

   a. Rotate stop bolt (10) counterclockwise until it contacts stick (1).

   b. Hold stop bolt (10). Tighten nut (13).

   c. Lockwire stop bolt (10) to nut (13). Use lockwire (E81).



12. **Hold pilot cyclic stick (1) against left stop bolt (10).** Adjust CPG left stop bolt (17) to contact 0.020-inch thickness gage (18) held against CPG cyclic stick (19).

   a. Hold pilot stick (1) against bolt (10).

   b. Hold gage (18) against stick (19) at bolt (10) contact area.

   c. Rotate stop bolt (17) counterclockwise to contact thickness gage (18).

   d. Hold stop bolt (17). Tighten nut (21).

   e. Lockwire stop bolt (17) to nut (21). Use lockwire (E81).

13. **Inspect (TI).**

GO TO NEXT PAGE

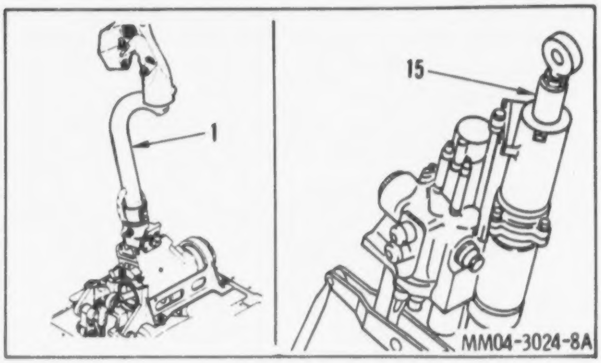
11-6-12. RIGGING PILOT AND CPG LATERAL CYCLIC STICK STOP BOLTS (cont) 11-6-12

14. **Observe piston (15) travel.**

15. **Fully extend piston (15) by slowly moving stick (1) right.**

    a. Slowly move stick (1) right until piston (15) is fully extended.

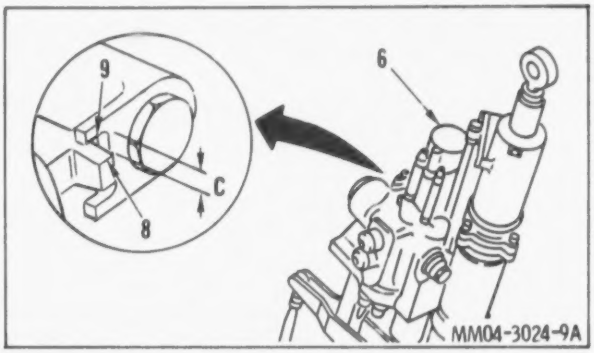
    b. Hold stick (1) in this position.



16. **Measure distance between arm (8) and bolt (9) on servocylinder (6).** This is measurement C. The difference between measurements A and C must be less than **0.030 inch.** Use caliper.

    a. If difference between measurement A and C is more than **0.030-inch,** move stick (1) slowly left until difference between measurement A and measurement C is less than **0.030 inch.**

    b. Hold stick in this position. Go to next step.



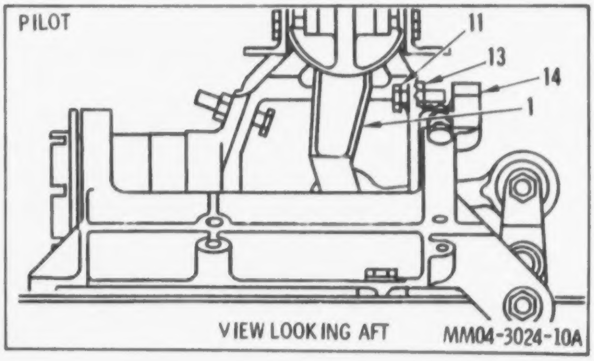
17. **Adjust bolt (11) to contact stick (1).**

    a. Rotate stop bolt (11) out of housing (13) until it contacts stick (1).

    b. Hold stop bolt (11). Tighten nut (16).

    c. Lockwire stop bolt (11) to nut (16). Use lockwire (E81).

18. **Inspect (TI).**



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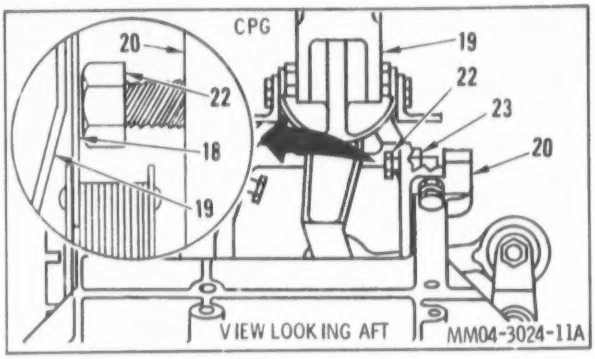
11-6-12. RIGGING PILOT AND CPG LATERAL CYCLIC STICK STOP BOLTS (cont) 11-6-12

19. **Hold pilot cyclic stick (1) against right stop bolt (11).** Adjust CPG right stop (22) to contract 0.020-inch thickness gage (18) held against CPG cyclic stick (19).
    a. Hold pilot stick (1) against right stop bolt (11).
    b. Hold gage (18) against CPG cyclic stick (19) at right stop bolt contact area.
    c. Rotate stop bolt (22) counterclockwise to contact thickness gage (18).
    d. Hold stop bolt (22). Tighten nut (23).
    e. Lockwire stop bolt (22) and nut (23). Use lockwire (E81).


CPG
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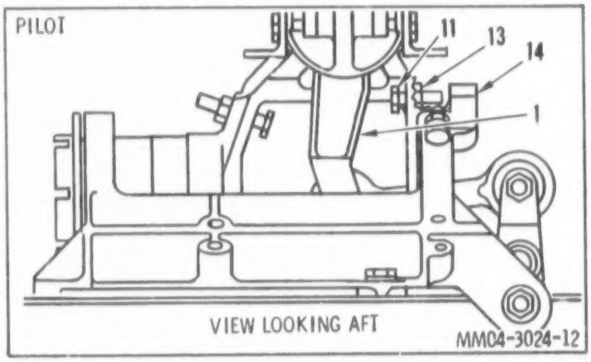
VIEW LOOKING AFT
MM04-3024-11A


PILOT
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1
VIEW LOOKING AFT
MM04-3024-12

20. **Inspect (TI).**
21. **Perform lateral (cyclic) flight control rigging operational check** (TM 55-1520-238-T).
22. **Disconnect external hydraulic power** (para 1-7-18).
23. **Install pilot cyclic stick cover** (para 11-3-28).
24. **Install CPG cyclic stick cover** (para 11-3-2).
25. **Inspect (TI).**
26. **Secure panels R200 and L200** (para 2-2-2).

END OF TASK

11-6-13. RIGGING UPPER LATERAL FLIGHT CONTROLS

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access panels R200 and L200 removed
1-7-18	External primary hydraulic power connected
11-6-10	Lateral flight controls between pilot and CPG cyclic sticks rigged
11-6-11	Rigging lateral flight controls between pilot cyclic stick and lateral servocylinder rigged
11-6-12	Rigging pilot and CPG lateral cyclic stick stop bolts rigged

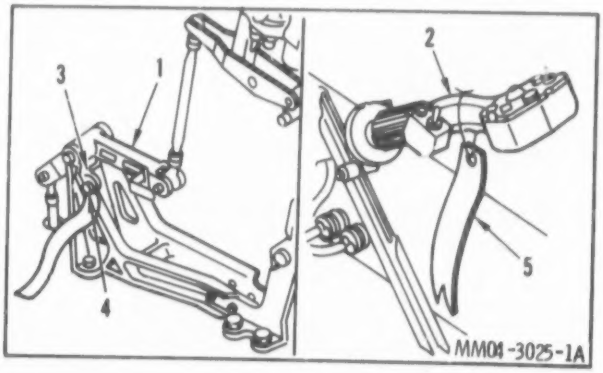
WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**
2. **Observe collective FS 165 bellcrank (1).**
3. **Move collective stick (2) slowly until rig pin holes (3) in collective FS 165 bellcrank (1) are alined.** Install -9 rig pin (4).
4. **Install collective stick warning flags (5).**



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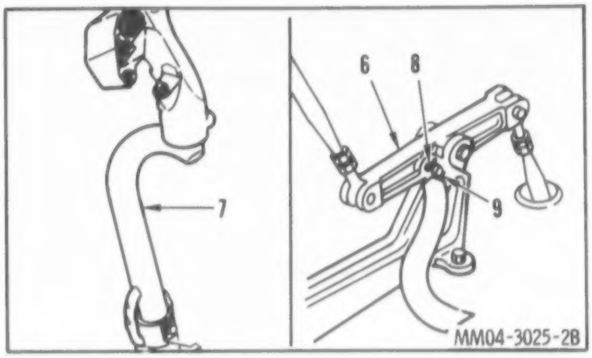
11-6-13. RIGGING UPPER LATERAL FLIGHT CONTROLS (cont) 11-6-13

5. Observe longitudinal FS 165 bellcrank (6).

6. Move pilot cyclic stick (7) slowly until rig pin holes (8) in bellcrank (6) are alined at level swashplate position. Install -5 rig pin (9).


7
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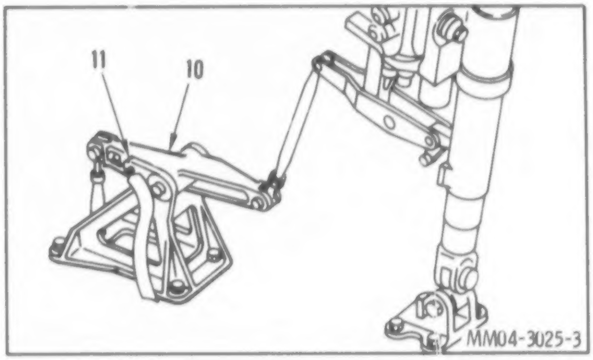
MM04-3025-2B

7. Observe lateral FS 165 bellcrank (10).

8. Move stick (7) slowly until rig pin holes in lateral FS 165 bellcrank (10) are alined at level swashplate position. Install -5 rig pin (11).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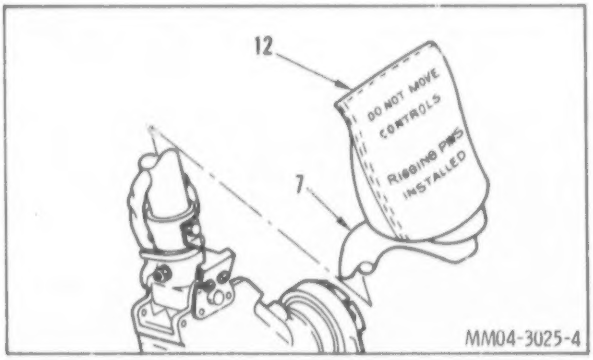
MM04-3025-3

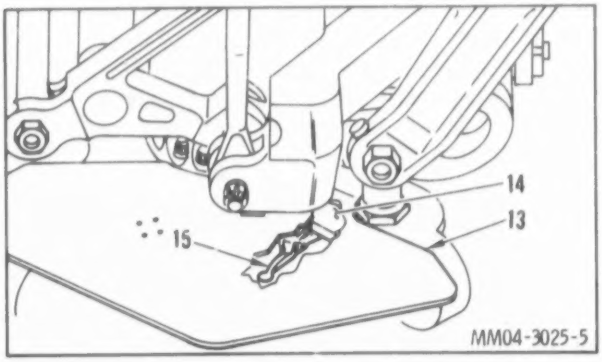
9. Install cyclic stick warning covers (12).


12
DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
7
MM04-3025-4

10. Install main rotor rigging plate (13) on right side of mast base (14).

    a. Position plate (13) on top of base (14).

    b. Fasten clamps (15) under plate (13).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MM04-3025-5

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11-6-13. RIGGING UPPER LATERAL FLIGHT CONTROLS (cont) 11-6-13

11. **Place main rotor rigging fixture (16) next to lateral link bolt (17).** Aline BASIC DIM pointer (18) with center of bolt (17).

    a. Place fixture (16) next to bolt (17).

    b. Loosen thumbscrew (19). Aline BASIC DIM pointer (18) with center of link bolt (17).

    c. Tighten thumbscrew (19).

    d. Mark shaft of fixture (16), using base of pointer (18) as a reference. Use pencil.

12. **Remove plate (13) from right side of mast base (14) and install on left side of mast base (14).** Ensure that rigging plate (13) is clear of all obstructions on top surface of mast base (14).

    a. Open clamps (15) under plate (13). Lift plate (13) from base (14).

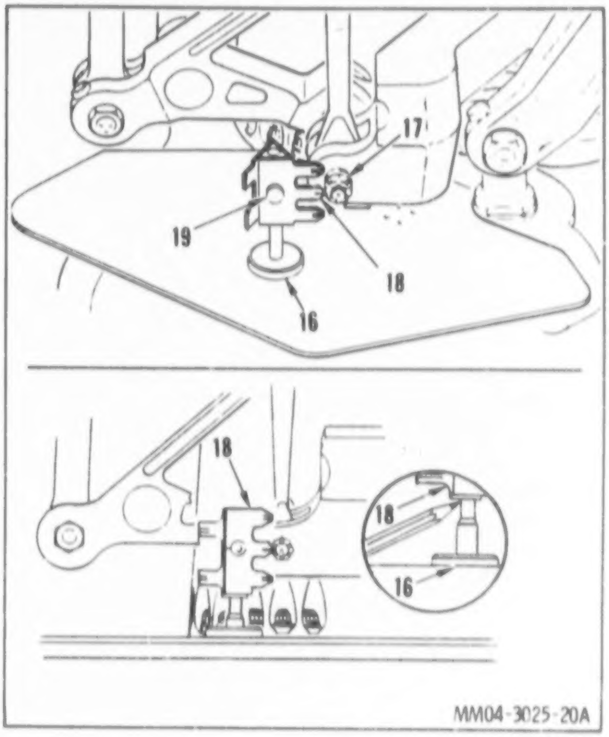
    b. Position plate (13) left side of base (14). Fasten clamps (15).

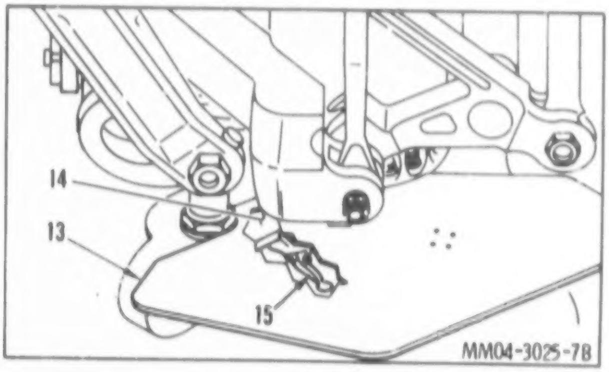
13. **Place main rotor rigging fixture (16) next to left lateral link bolt (20).** Check that BASIC DIM pointer (18) alines with center of left link bolt (20).

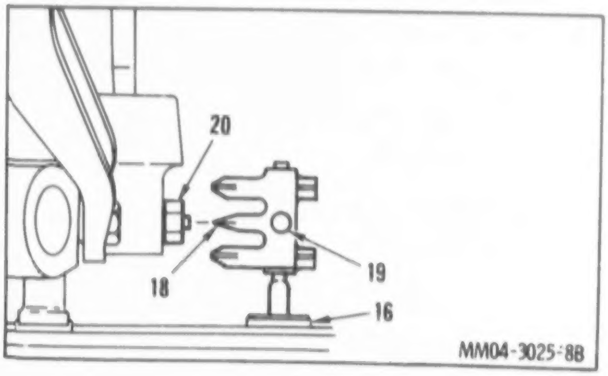
    a. If BASIC DIM pointer (18) alines with center of lateral link bolt (20), go to step 16.

    b. If BASIC DIM pointer (18) does not aline with center of left lateral link bolt (20), perform steps 13c thru g then adjust lateral servocylinder rod end (para 11-6-18).

    c. Loosen thumbscrew (19) and aline BASIC DIM pointer (18) with center of left lateral link bolt (20).







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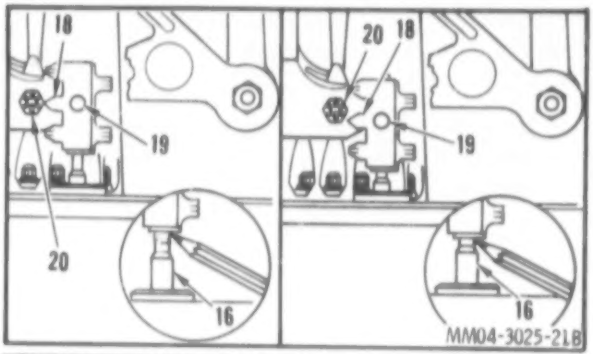
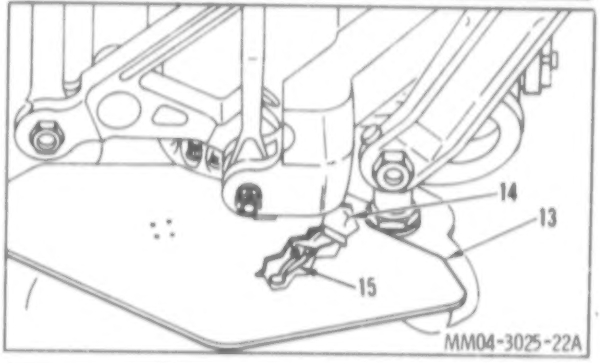
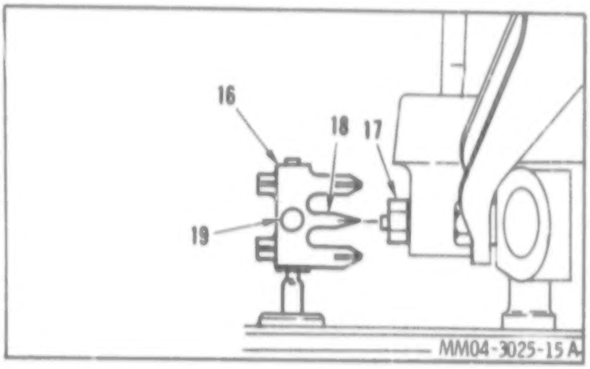
11-6-13. RIGGING UPPER LATERAL FLIGHT CONTROLS (cont) 11-6-13



- d. Mark shaft of fixture (16), using base of pointer (18, as reference. Use pencil.
- e. Loosen thumbscrew (19). Measure and record distance between pencil marks on fixture (16).
- f. Divide dimension by 2. Record to determine adjustment dimension.
- g. Mark shaft of fixture (16) at dimension indicated in step 13.f. Reset pointer (18) on shaft to this mark.



14. **Remove plate (13) from left side of base (14) and install on right side of base (14).**
    - a. Unfasten clamps (15) under plate (13).
    - b. Lift plate (13) from base (14).



15. **Place fixture (16) next to bolt (17).** Check that pointer (18) alines with center of bolt (17).
    - a. If pointer (18) alines with bolt (17), go to step 16.
    - b. If pointer (18) does not aline with center of right link bolt (20), repeat steps 12 thru 15.

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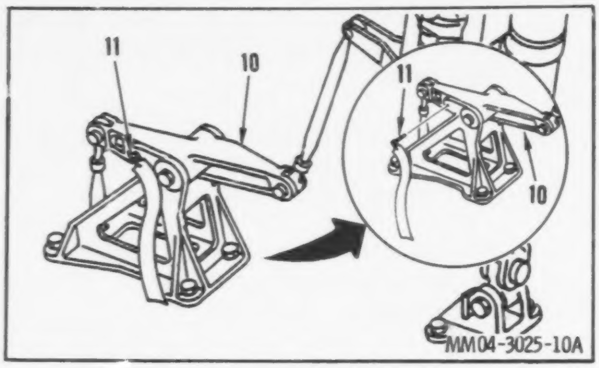
WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.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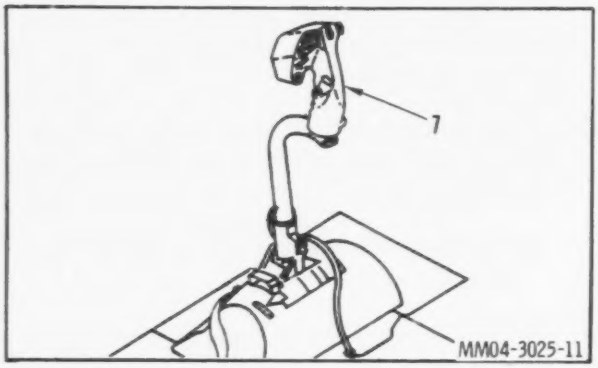
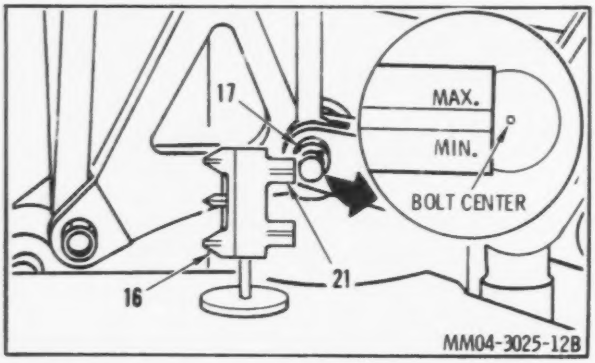
MM04-3025-10A

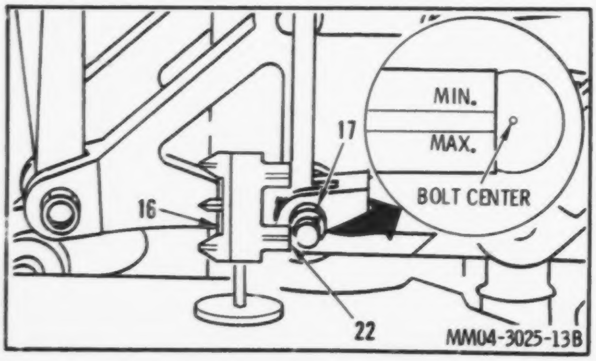
16. **Remove -5 rig pin (11) from bellcrank (10).**


7
MM04-3025-11

17. **Move stick (7) left until it contacts stop. Hold in position.** Check alinement of bolt (17) with pointer (21) on fixture (16).
    a. If center of bolt (17) falls between **MIN** and **MAX** marks on pointer (21), go to next step.
    b. If center of bolt (17) does not fall between **MIN** and **MAX** marks on pointer (21), rig lateral stick stops (para 11-6-12).


17
MAX.
MIN.
BOLT CENTER
16
21
MM04-3025-12B

18. **Move stick (7) right until it contacts stop.** Hold in position. Check alinement of bolt (17) with pointer (22) on fixture (16).
    a. If center of bolt (17) falls between **MIN** and **MAX** marks on pointer (22), go to next step.
    b. If center of bolt (17) does not fall between **MIN** and **MAX** marks on pointer (22), rig lateral stick stops (para 11-6-12).


MIN.
17
MAX.
BOLT CENTER
16
22
MM04-3025-13B

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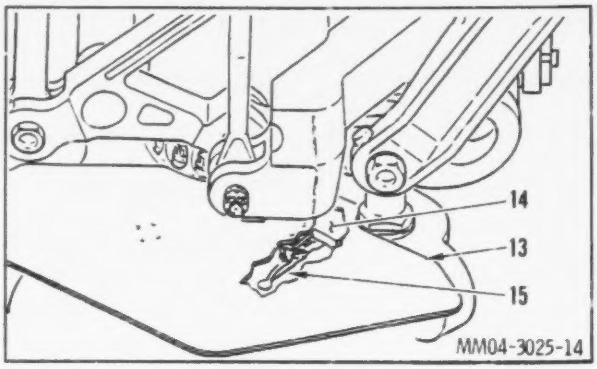
11-6-13. RIGGING UPPER LATERAL FLIGHT CONTROLS (cont) 11-6-13

19. **Remove plate (13) from mast base (14).**

    a. Loosen clamps (15).

    b. Remove plate (13).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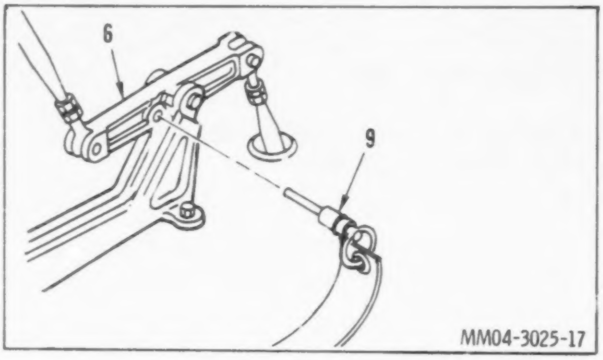
MM04-3025-14

20. **Remove -5 rig pin (9) from bellcrank (6).**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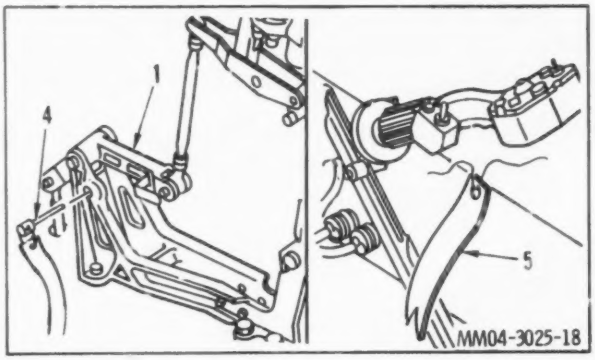
MM04-3025-17

21. **Remove -9 rig pin (4) from bellcrank (1).**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MM04-3025-18

22. **Check lateral controls for freedom of movement and 0.0625-inch clearance between control rods and bellcranks and structure.**

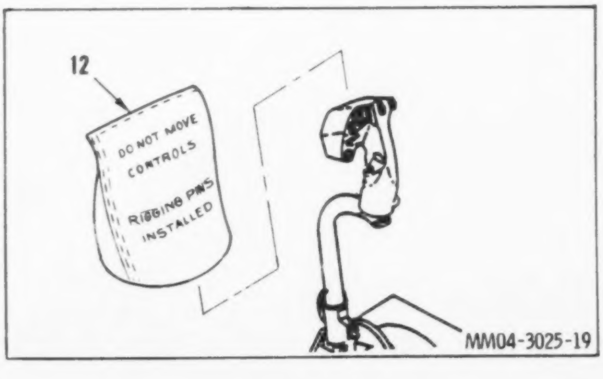
    a. Slowly move cyclic stick to full right, check for freedom of movement and 0.0625-inch clearance between rods and bellcranks and structure. If clearance is not 0.0625-inch go back to step 17a.

    b. Slowly move cyclic stick full left, check for freedom of movement and 0.0625-inch clearance between rods and bellcranks and structure.

23. **Inspect (TI).**

24. **Perform lateral (cyclic) flight control rigging operational check** (TM 55-1520-238-T).

25. **Remove cyclic covers (12) and flags (5).**


12
DO NOT MOVE CONTROLS
RIGGING PINS INSTALLED
MM04-3025-19

26. **Disconnect primary hydraulic external power** (para 1-7-18).

27. **Secure access covers R200 and L200** (para 2-2-2).

END OF TASK

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11-6-14. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT AND CPG PEDALS 11-6-14

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit Control System	1730-01-240-1577
Headset-Microphone (2)	5965-00-755-4656
Cord Assembly, Electrical-Maintenance Headset	5995-01-163-9549

Personnel Required:

67R10	Attack Helicopter Repairer (2)
66R30	Inspector/Supervisor

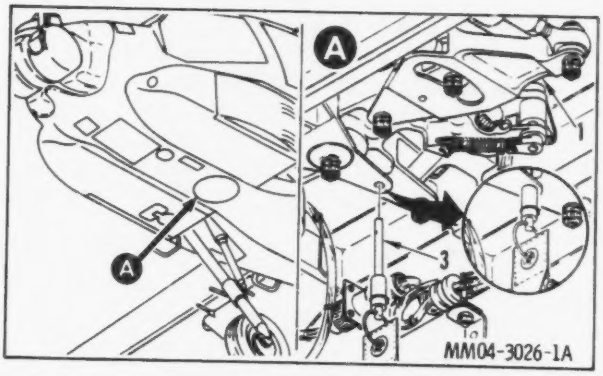
References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access cover B60 and L540 removed
TM 9-1090-208-23	Area weapon removed

1. Disconnect FS 542 push-pull rod from directional servocylinder input lever (para 7-2-39).
2. Enter pilot station (para 1-7-1). Observe all safety precautions.
3. Observe pilot directional SPAD (1).
4. Slowly move pilot directional pedals (2) to aline rig pin holes in SPAD (1).
5. Have assistant install -9 rig pin (3) in SPAD (1).



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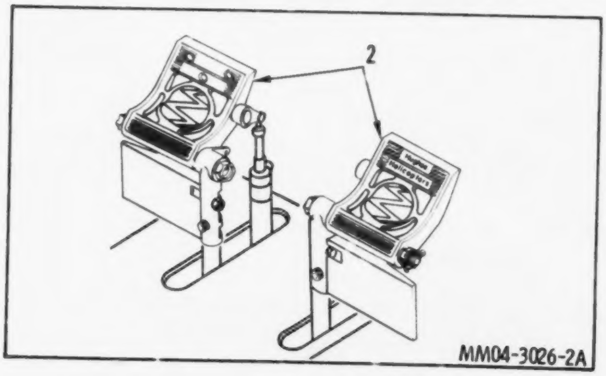

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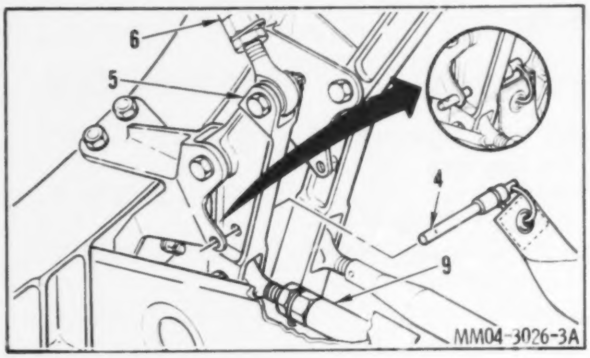
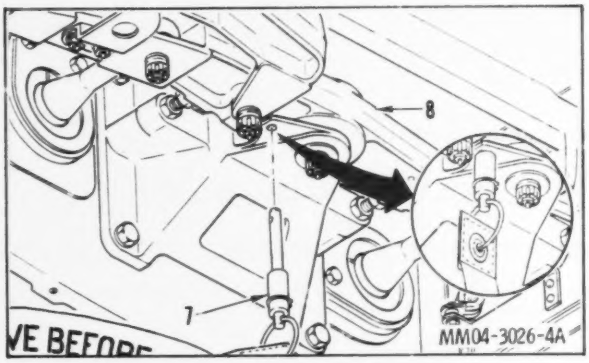
11-6-14. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT AND CPG PEDALS (cont) 11-6-14



6. **Install -9 rig pin (4) in directional FS 110 bellcrank (5).**

   a. If pin (4) cannot be installed, adjust forward end of FS 110 push-pull rod (6) to aline rig pin holes (para 11-2-2).

   b. Install pin (4).



7. **Install -9 rig pin (7) into CPG SPAD (8).**

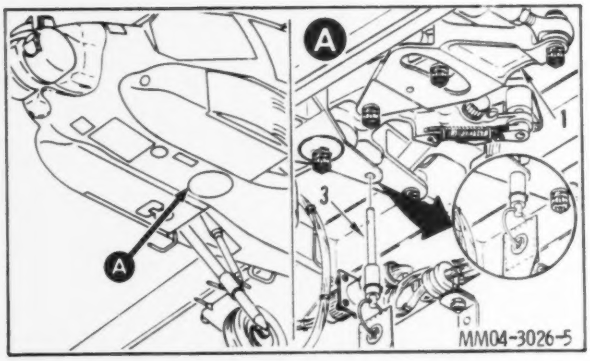
   a. If pin (7) cannot be installed, adjust aft end of FS 59 push-pull rod (9) to aline rig pin holes (para 11-2-2).

   b. Install pin (7).

8. **Remove pin (7) from SPAD (8).**

9. **Remove pin (4) from bellcrank (5).**

10. **Remove pin (3) from SPAD (1).**



11. **Connect FS 542 push-pull rod to directional servocylinder input lever** (para 7-2-40).

12. **Inspect (TI).**

13. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

14. **Install area weapon** (TM 9-1090-208-23).

15. **Inspect (TI).**

16. **Install access cover L540** (para 2-2-2).

17. **Install access cover B60** (para 2-2-2).

END OF TASK

11-6-15. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT PEDALS AND DIRECTIONAL SERVOCYLINDER 11-6-15

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879
Headset-Microphone (2)	5965-00-755-4656
Cord Electrical-Maintenance Headset	5995-01-163-9549

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access cover L200 removed
2-2-3	Access covers L540, L325, and L510 removed
1-7-18	Primary external hydraulic power connected
TM 9-1090-208-23	Area weapon removed
11-6-14	Directional flight controls between pilot and CPG pedals rigged

GO TO NEXT PAGE

11-6-15. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT PEDALS AND DIRECTIONAL SERVOCYLINDER (cont) 11-6-15

WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

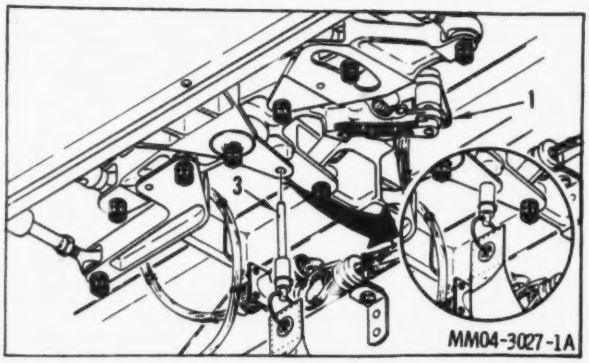
1. Disconnect FS 542 push-pull rod from directional servocylinder input lever (para 7-2-39).

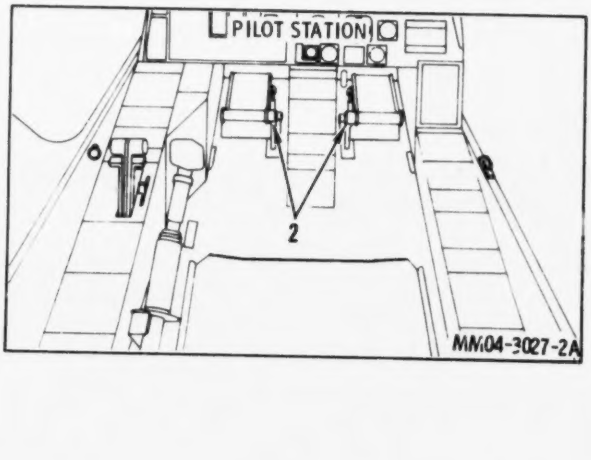
2. Enter pilot station (para 1-7-1). Observe all safety precautions.

3. Observe pilot directional SPAD (1).

4. Slowly move pilot directional pedals (2) to aline rig pin holes in SPAD (1).

5. Have assistant install -9 rig pin (3) in SPAD (1).





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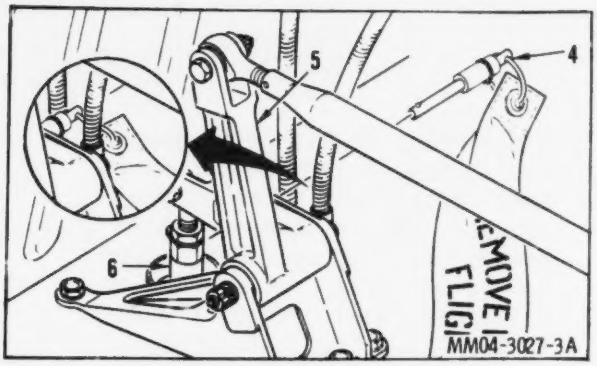
11-6-15. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT PEDALS AND DIRECTIONAL SERVOCYLINDER (cont) 11-6-15

6. Install -9 rig pin (4) in directional FS 164 bellcrank (5).
   a. If pin (4) cannot be installed, adjust upper end of FS 160 push-pull rod (6) to aline rig pin holes (para 11-2-2).
   b. Install pin (4).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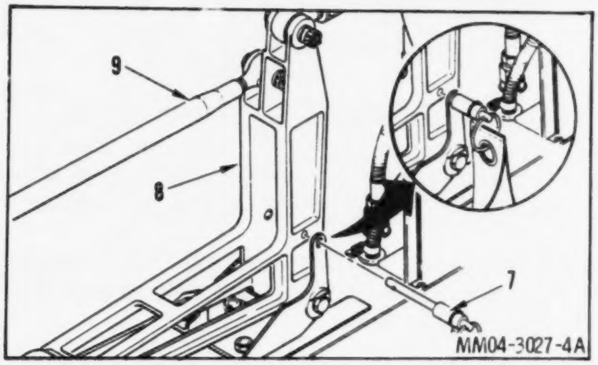
REMOVE
FLIGH
MM04-3027-3A

7. Install -5 rig pin (7) in directional FS 215 bellcrank (8).
   a. If pin (7) cannot be installed, adjust aft end of FS 199 push-pull rod (9) to aline rig pin holes (para 11-2-2).
   b. Install pin (7).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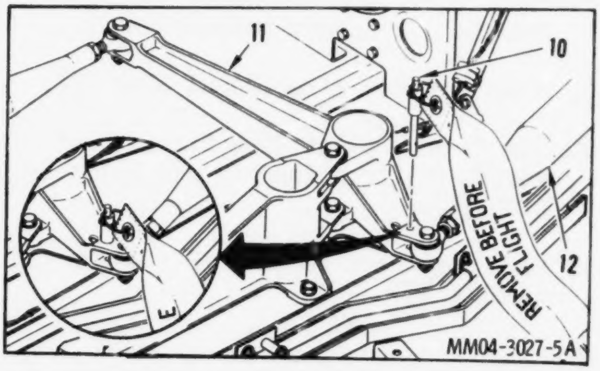
MM04-3027-4A

8. Install -9 rig pin (10) in directional FS 348 bellcrank (11).
   a. If pin (10) cannot be installed, adjust aft end of FS 275 push-pull rod (12) to aline rig pin holes (para 11-2-2).
   b. Install -9 rig pin (10).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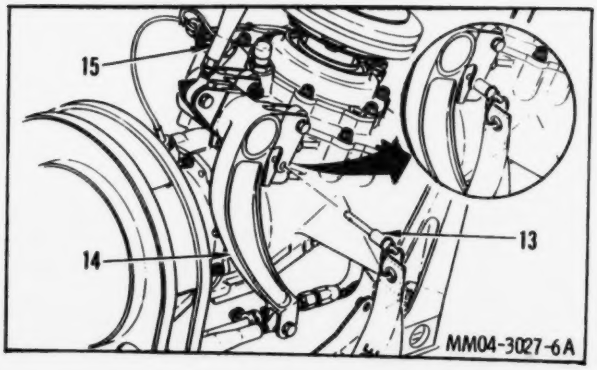
REMOVE BEFORE FLIGHT
MM04-3027-5A

9. Install -9 rig pin (13) in directional FS 520 bellcrank (14).
   a. If pin (13) cannot be installed, adjust aft end of FS 348 push-pull rod (15) to aline rig pin holes (para 11-2-2).
   b. Install pin (13).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MM04-3027-6A

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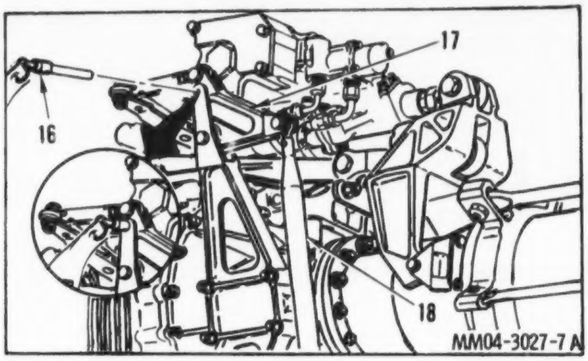
11-6-15. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT PEDALS AND DIRECTIONAL SERVOCYLINDER (cont) 11-6-15

10. **Install -9 rig pin (16) in directional FS 542 bellcrank (17).**

    a. If pin (16) cannot be installed, adjust upper end of FS 520 push-pullrod (18) to aline rig pin holes (para 11-2-2).

    b. Install pin (16).



MM04-3027-7 A

11. **Slowly move directional servocylinder input lever (19) to aline lower lever (20) with upper edge of boss (21) on servocylinder body.**

12. **Check that holes in lever (19) aline with FS 542 push-pull rod end (22).**

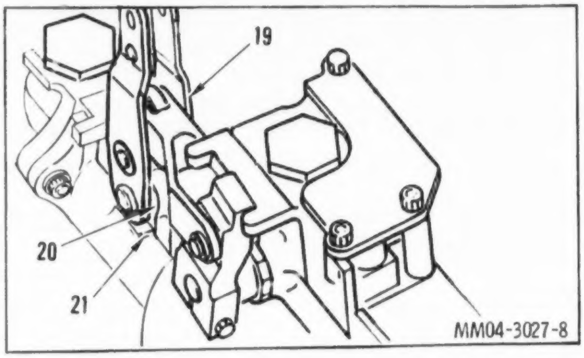
    a. If lever (19) holes do not aline with rod end (22), adjust end of FS 542 push-pull rod (23) to aline holes (para 11-2-2).

    b. If holes in lever (19) aline with rod end (22), go to next step.

13. **Connect FS 542 push-pull rod (23) lever (19)** (para 7-2-40).

14. **Remove pin (16) from bellcrank (17).**

15. **Remove pin (13) from bellcrank (14).**



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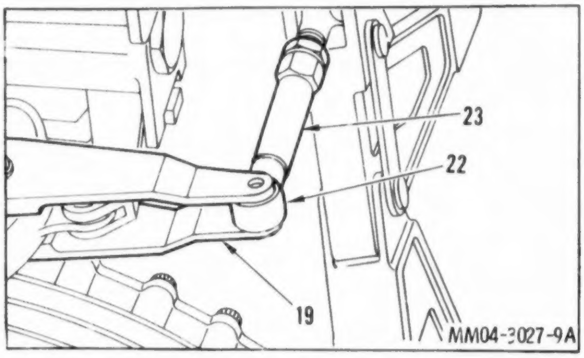

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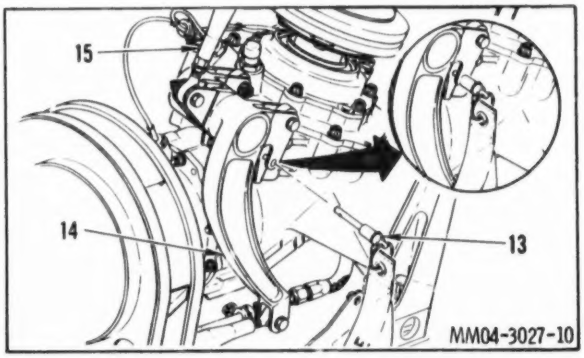

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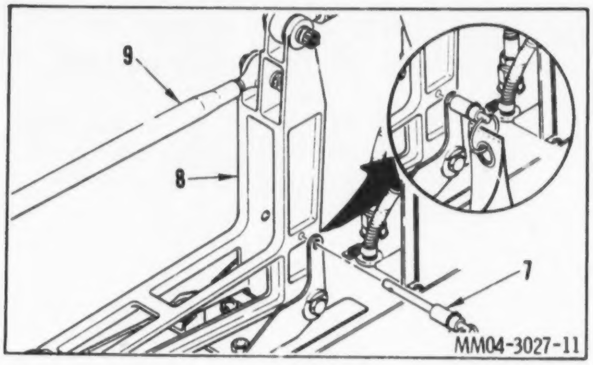
11-6-15. RIGGING DIRECTIONAL FLIGHT CONTROLS BETWEEN PILOT PEDALS AND DIRECTIONAL SERVOCYLINDER (cont) 11-6-15

16. **Remove -9 rig pin (10) from bellcrank (11).**
17. **Remove -5 rig pin (7) from bellcrank (8).**
18. **Remove -9 rig pin (4) from bellcrank (5).**
19. **Remove -9 rig pin (3) from SPAD (1).**
20. Inspect (TI).
21. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).
22. **Disconnect external hydraulic power** (para 1-7-18).
23. **Install area weapon** (TM 9-1090-208-23).
24. Inspect (TI).
25. **Secure access covers L200, L325, L510, and L540** (para 2-2-2).



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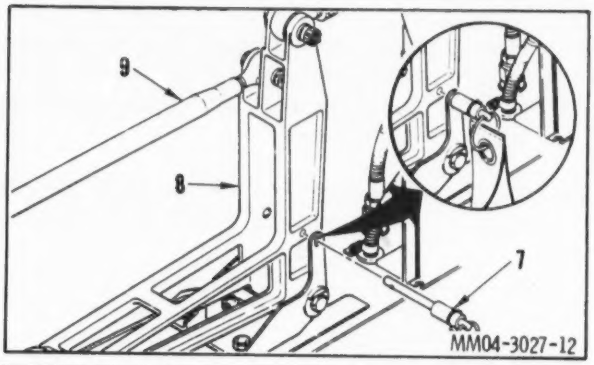

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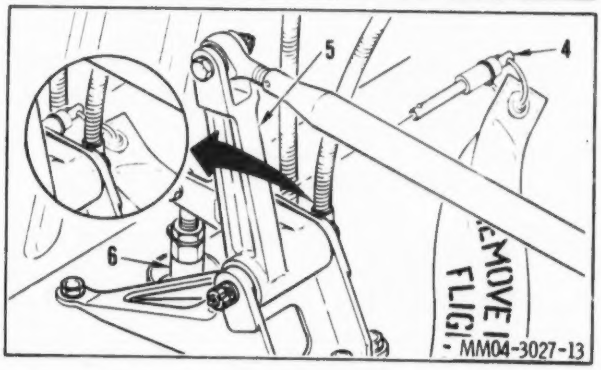

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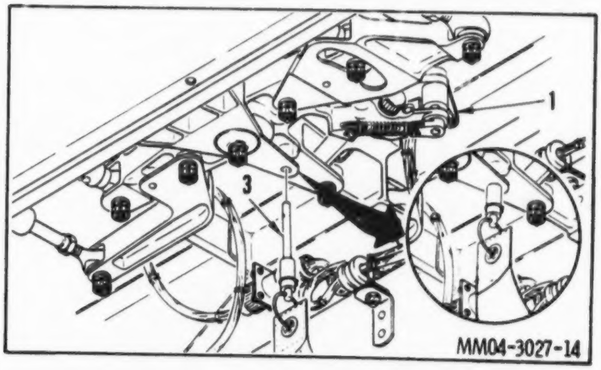

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END OF TASK

11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS 11-6-16

Tools:

N clature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control Sys	1730-01-240-1577
Aviation Ground Power Unit (AGPU)	1730-01-144-1879
Headset-Microphone (2)	5965-00-755-4656
Cord Electrical-Maintenance Headset	5995-01-163-9549
Caliper, Vernier	5210-00-234-8017

Materials/Parts:

(E81) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access covers B60, L200, and L540 removed
1-7-18	External primary hydraulic power connected
TM 9-1090-208-23	Gun removed
11-6-14	Directional flight controls between pilot and CPG pedals rigged
11-6-15	Directional flight controls between pilot pedals and directional servocylinder rigged

GO TO NEXT PAGE

11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS (cont) 11-6-16

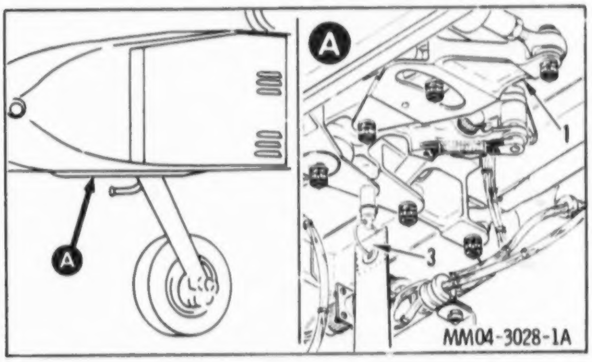
WARNING

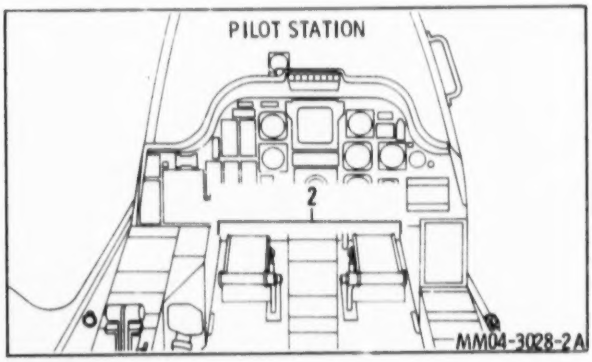
Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system, do not use force if binding or roughness occurs while moving controls with hydraulic power.

1. Enter pilot station (para 1-7-1). Observe all safety precautions.
2. Observe pilot directional SPAD (1).
3. Slowly move pilot directional pedals (2) to aline rig pin holes in SPAD (1).
4. Install -9 rig pin (3) in SPAD (1).





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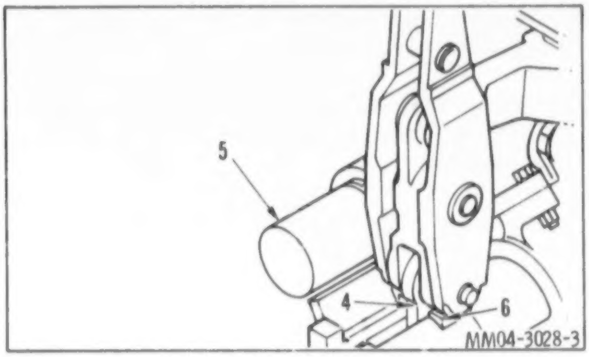
11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS (cont) 11-6-16

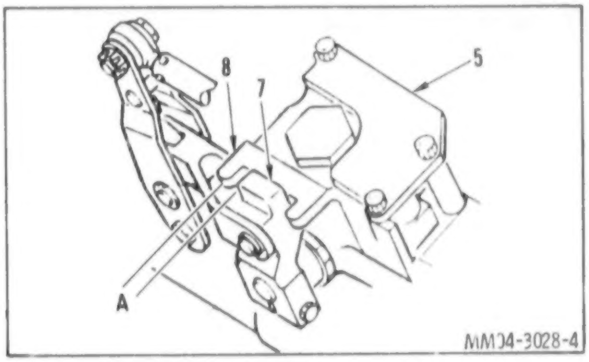
5. **Check that lower lever (4) on directional servocylinder (5) is alined with upper edge of boss (6) on servocylinder body.**

   a. If lever (4) is not alined with upper edge of boss (6), rig directional controls between pilot pedal and directional servocylinder (para 11-6-15).

   b. If lever (4) is alined with upper edge of boss (6), go to next step.



6. **Measure distance between valve arm (7) and stop bolt (8) on servocylinder (5).** This is measurement A. Use caliper.



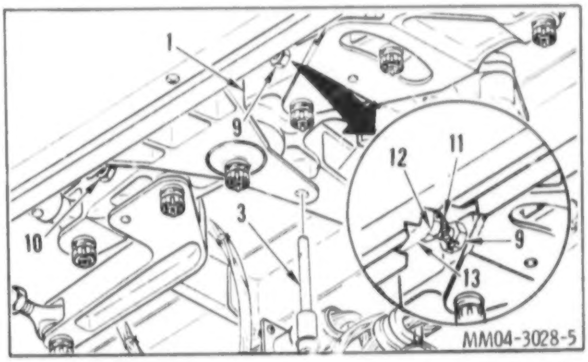
7. **Remove pin (3) from SPAD (1).**

8. **Back off pilot directional pedals left limit stop bolt (9) and right limit stop bolt (10).**

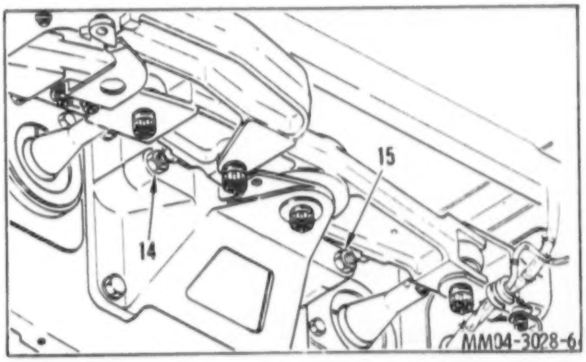
   a. Remove lockwire (11) (four places).

   b. Loosen nut (12) and turn stop bolt (9) into bracket (13).

   c. Repeat a. and b. for pilot right limit stop bolt (10).



9. **Perform step 8 above for CPG left limit stop bolt (14) and right limit stop bolt (15).**



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10. **Observe directional servocylinder piston (17) travel.**

11. **Fully retract piston (17) by slowly moving pilot right pedal (18) forward.**

    a. Slowly push pedal (18) forward until piston (17) is fully retracted.

    b. Hold pedals (2) in this position.

12. **Measure distance between arm (7) and bolt (8) on servocylinder (5).** This is measurement B. Difference between measurements A and B must be **less than 0.030-inch.** Use caliper.

    a. If difference between measurement A and B is more than 0.030-inch, move pilot left pedal (19) forward until difference between measurement A and measurement B **is less than 0.030-inch.**

    b. Hold pedals in this position.

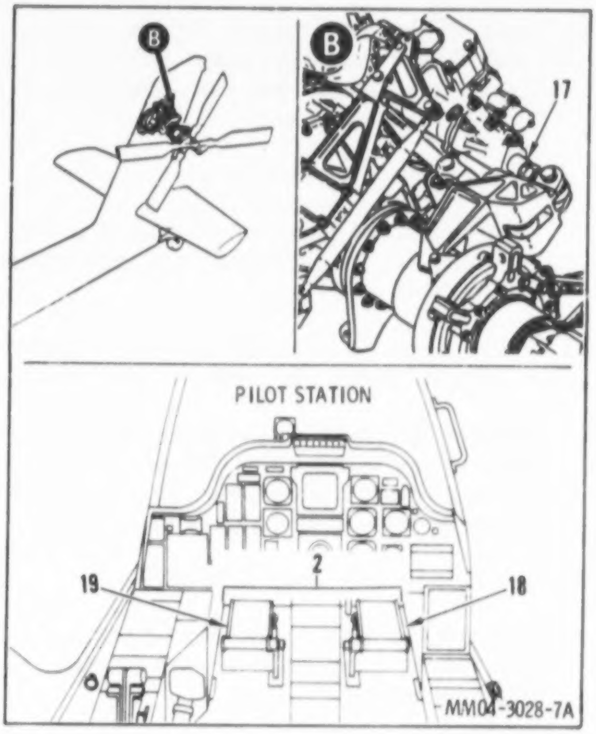
13. **Adjust bolt (10) to contact SPAD (1).**

    a. Rotate bolt (10) counterclockwise to contact SPAD (1).

    b. Hold bolt (10). Tighten nut (12).

    c. Lockwire stop bolt (10) to nut (12). Use lockwire (E81).

14. **Hold pedal (18) against bolt (10).**



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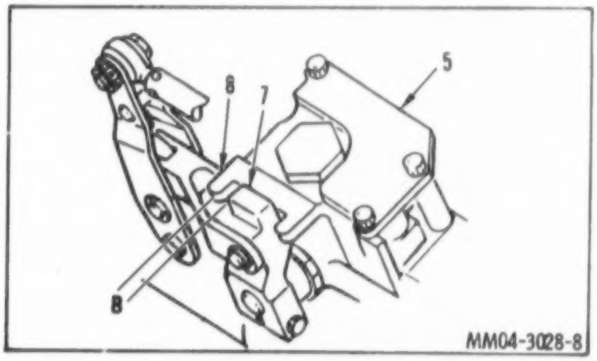

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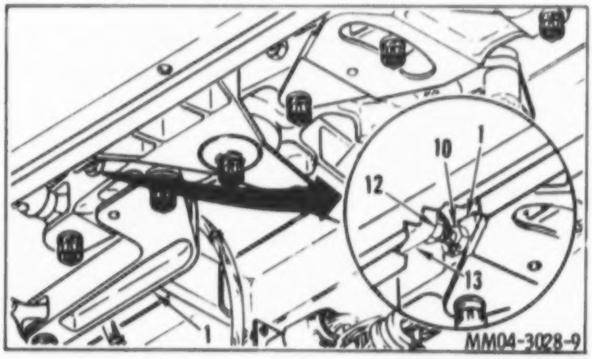

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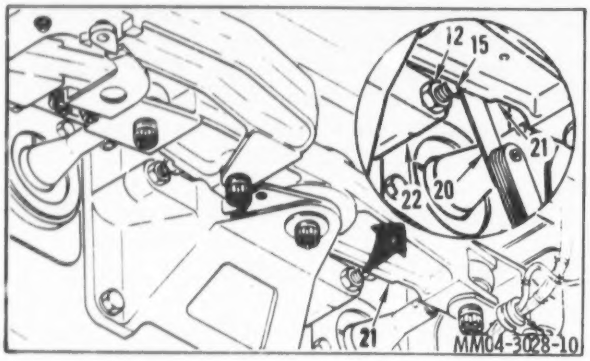
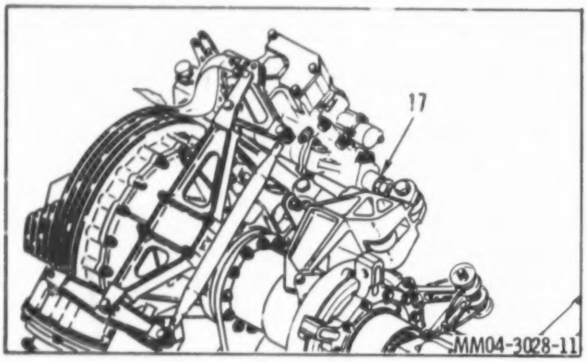
11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS (cont) 11-6-16

15. **Adjust bolt (15) contact, using 0.020-inch** thickness gage (20) held between bolt (15) and SPAD (21).
    a. Hold gage (20) against CPG SPAD (21).
    b. Rotate bolt (15) counterclockwise until it contacts gage (20).
    c. Hold bolt (15). Tighten nut (12).
    d. Lockwire stop bolt (15) to nut (12). Use lockwire (E81).

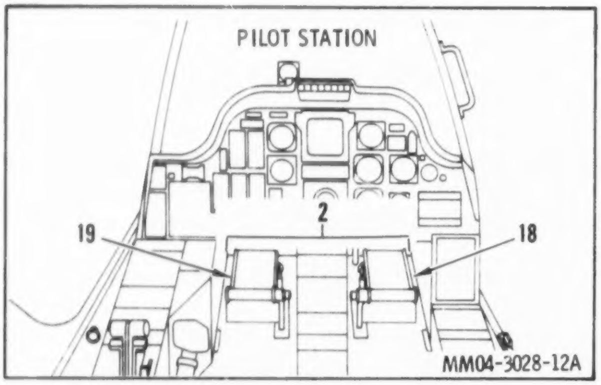


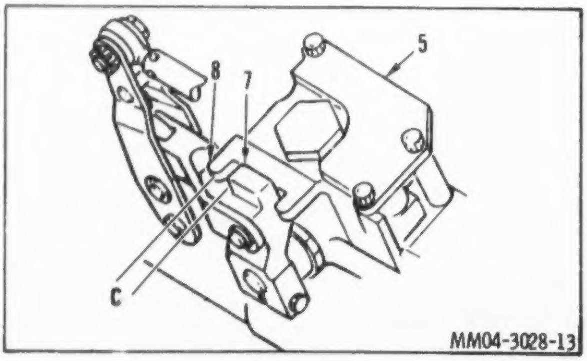
16. **Observe piston (17) travel.**

17. **Fully extend piston (17) by slowly pushing pilot left pedal forward.**
    a. Slowly push pedal (19) forward until piston (17) is fully extended.
    b. Hold pedal (19) in this position.



18. **Measure distance between valve arm (7) and stop bolt (8) on directional servocylinder (5).** This is measurement C. Difference between measurements A and C must be between **0.210 and 0.270-inch.**
    a. If difference between measurements A and C is more than **0.270-inch,** move pedal (18) forward until difference between measurements A and B is between **0.210 and 0.270-inch.**





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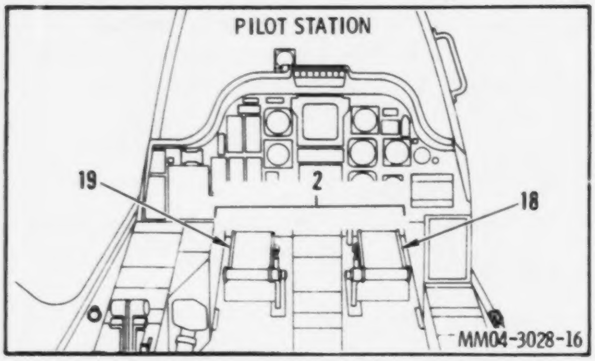
11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS (cont) 11-6-16

b. If difference between measurements A and C is less than **0.210-inch,** move pilot left pedal (19) forward until difference between measurements A and C is between **0.210** and **0.270-inch.**

c. Hold pedals (2) in this position.

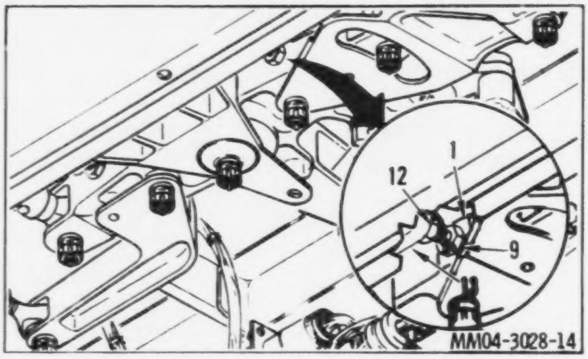


19. **Adjust bolt (9) to SPAD (1).**

a. Rotate bolt (9) out of bracket (13) until it contacts SPAD (1).

b. Hold bolt (9). Tighten nut (12).

c. Lockwire stop bolt (9) and nut (12). Use lockwire (E81).



20. **Hold pilot left pedal (19) against stop bolt (9).** Adjust CPG left limit stop bolt (14) to contact gage (20) held between bolt (14) and CPG SPAD (21).

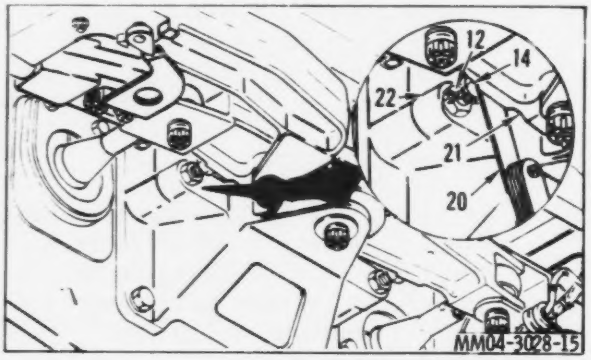
a. Hold pedal (19) against bolt (9).

b. Hold gage (20) against CPG SPAD (21).

c. Rotate bolt (14) counterclockwise until it contacts gage (20) held against CPG SPAD (21).

d. Hold bolt (14). Tighten nut (12).

e. Lockwire stop bolt (14) and nut (12). Use lockwire (E81).



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11-6-16. RIGGING PILOT AND CPG DIRECTIONAL PEDAL STOP BOLTS (cont) 11-6-16

20. Inspect (TI).

21. Perform directional flight control rigging operational check (TM 55-1520-238-T).

22. Disconnect external hydraulic power (para 1-7-18).

23. Install area weapon (TM 9-1090-208-23).

24. Inspect (TI).

25. Install access covers B60, L200, and L540 (para 2-2-2).

END OF TASK

11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS 11-6-17

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed
2-2-2	Access cover L540 removed
1-7-18	External primary hydraulic power connected
11-6-14	Directional flight controls between pilot and CPG pedals rigged
11-6-15	Directional flight controls between pilot pedals and directional servocylinder rigged
11-6-16	Pilot and CPG directional pedal stop bolts rigged

GO TO NEXT PAGE

11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS (cont) 11-6-17

WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

CAUTION

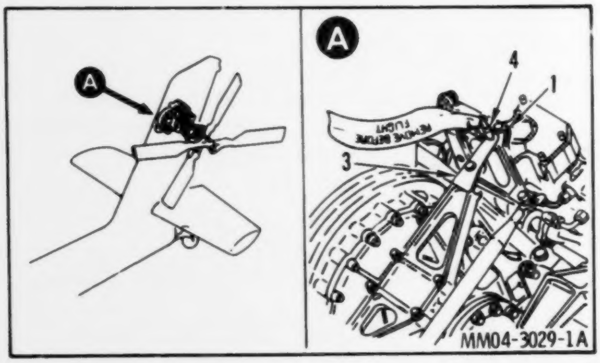
To prevent damage to flight control system components, do not use force if binding or roughness occur while moving controls with hydraulic power.

1. **Enter pilot station** (para 1-7-1). **Observe all safety precautions.**

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

2. **Observe directional FS 542 bellcrank (1).**
3. **Slowly move pilot directional pedals (2) to aline rig pin holes in bellcrank (1) and bracket (3).**
4. **Install -9 rig pin (4) in bellcrank (1) and bracket (3).**



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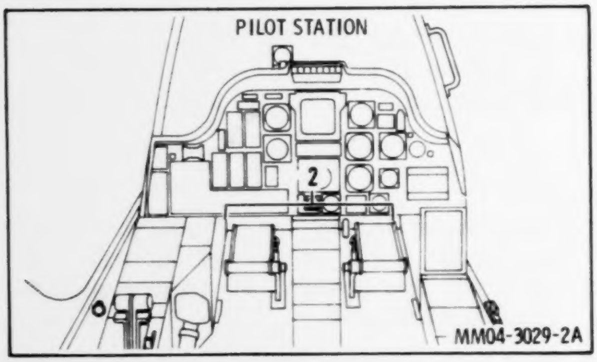

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11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS (cont) 11-6-17

5. **Adjust tail rotor rigging fixture (5) to BASIC DIM hole (6).** Install pin (7).

   a. Aline holes in slide (8) with hole (6) in support (9).

   b. Install pin (7).

6. **Install fixture (5) between tail rotor gearbox mast base (10) and swashplate (11).** Check that no play exists between fixture (5) and swashplate (11).

   a. Insert fixture (5) between mast base (10) and swashplate (11).

   b. Hold slide (8) firmly against mast base (10).

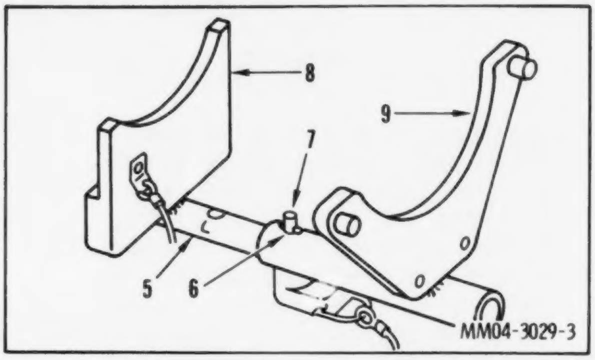
   c. Check that support (9) contacts swashplate (11).

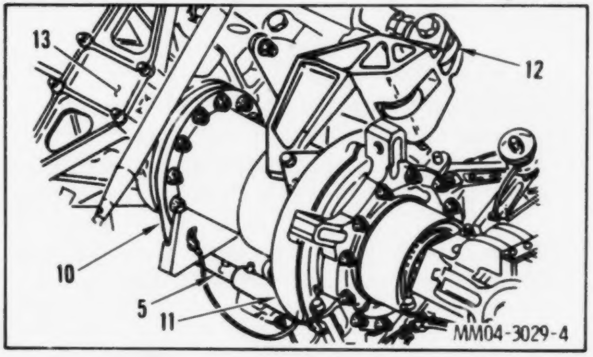
   d. If support (9) does not contact swashplate (11), adjust directional servocylinder rod end (12) (para 11-6-18).

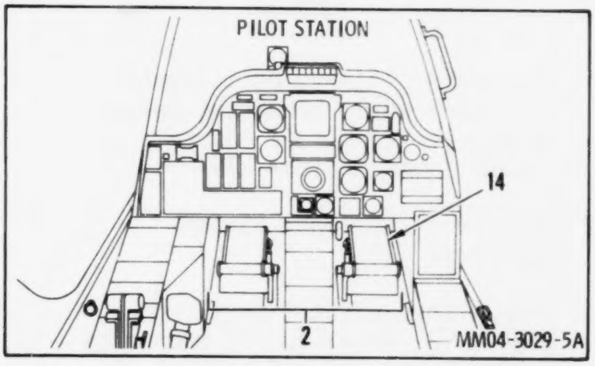
   e. If support (9) contacts swashplate (11), go to next step.

7. **Remove fixture (5) from tail rotor gearbox (13).**

8. **Remove -9 rig pin (4) from bellcrank (1).**







WARNING

To prevent injury, maintenance personnel shall be warned before controls are moved. If injury occurs, seek medical aid.

9. **Move pilot right directional pedal (14) forward until it contacts stop.** Hold pedal (14) in this position.

GO TO NEXT PAGE

11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS (cont) 11-6-17

10. **Adjust fixture (5) to right pedal position (15).** Install pin (7).

    a. Aline right pedal hole in slide (8) with hole (15) in support (9).

    b. Install pin (7).

11. **Install fixture (5) between base (10) and swashplate (11).** Check that fixture contacts mast base (10) and swashplate (11).

    a. Insert fixture between base (10) and swashplate (11).

    b. Hold slide (8) firmly against mast base (10). Move support (9) until it contacts swashplate (11).

    c. If support (9) does not contact swashplate (11), or if fixture (5) cannot be installed, rig directional flight control stops (para 11-6-16).

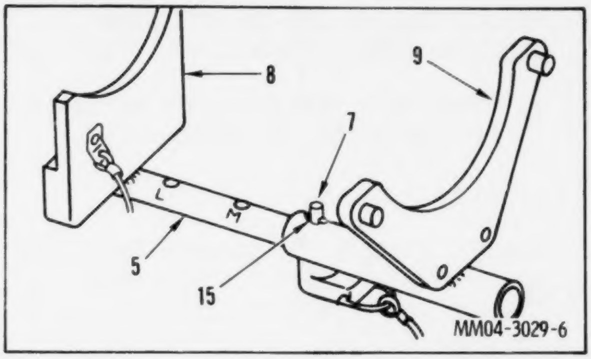
    d. If support (9) contacts swashplate (11), go to next step.

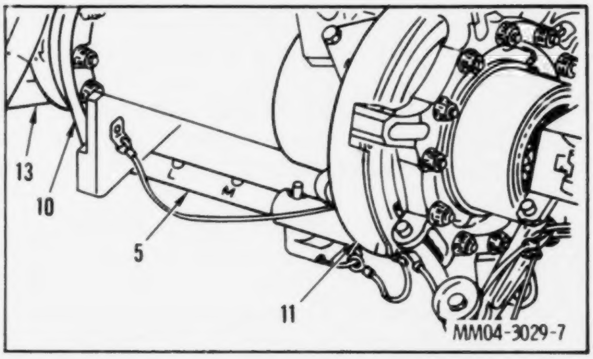
12. **Remove tail rotor rigging fixture (5) from tail rotor gearbox (13).**

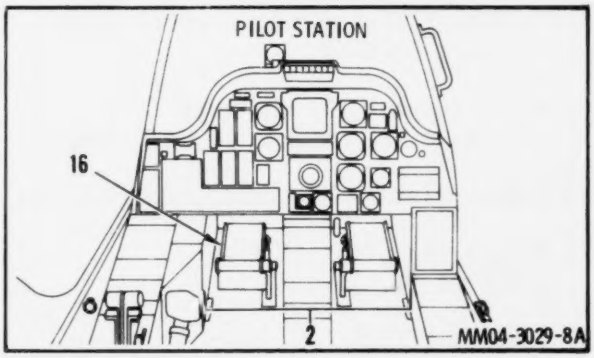
WARNING

To prevent injury, maintenance personnel shall be warned before controls are moved. If injury occurs, seek medical aid.

13. **Move pilot left directional pedal (16) forward until it contacts stop.**







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11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS (cont) 11-6-17

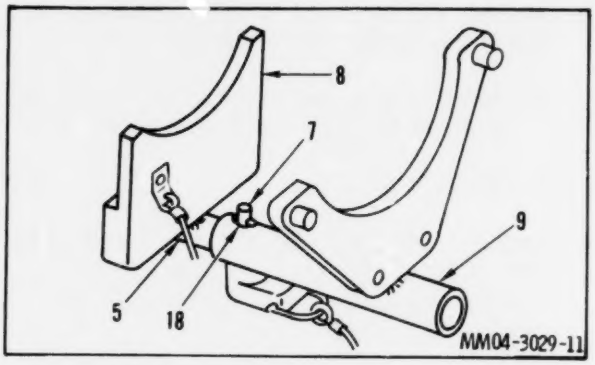
14. **Adjust fixture (5) to left pedal position (18).** Install pin (7).
    a. Aline left pedal hole in slide (8) with hole (18) in support (9).
    b. Install pin (7).

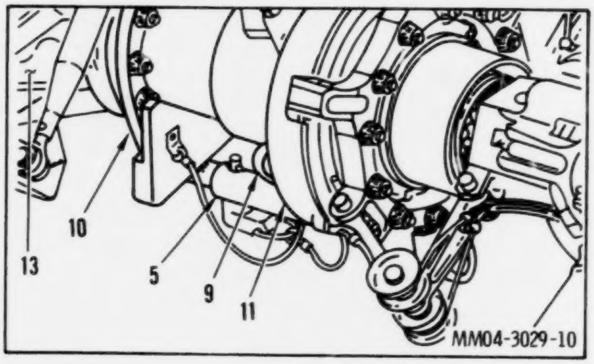
15. **Install fixture (5) between base (10) and swashplate (11).** Check that fixture contacts base (10) and swashplate (11).
    a. Insert fixture (5) between base (10) and swashplate (11).
    b. Hold slide (8) firmly against base (10). Move support (9) toward swashplate (11).
    c. Check that support (9) contacts swashplate (11).
    d. If support (9) does not contact swashplate (11) or if fixture cannot be installed, rig directional flight control stops (para 11-6-16).
    e. If support (9) contacts swashplate (11) go to next step.

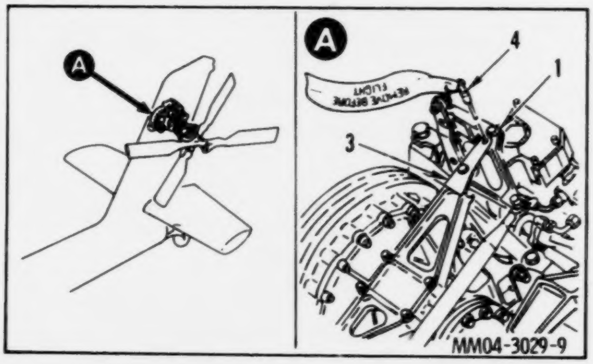
16. **Remove fixture (5) from gearbox (13).**

17. **Remove rig pin (14) from brackets (1, 3).**

18. **Inspect (TI).**







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11-6-17. RIGGING TAIL ROTOR DIRECTIONAL FLIGHT CONTROLS (cont) 11-6-17

19. **Check tail rotor directional controls for freedom of movement and 0.0625-inch clearance between control rods and bellcranks and structure.**

    a. Slowly move left pedal full down. Check for freedom of movement and **0.0625-inch** clearance between rods, bellcranks, and structure. If clearance is not **0.0625-inch** go back to step 6d.

    b. Slowly move right pedal full down, check for freedom of movement and **0.0625-inch** clearance between rods, bellcranks, and structure.

20. **Perform directional flight control rigging operational check** (TM 55-1520-238-T).

21. **Disconnect primary external hydraulic power** (para 1-7-18).

22. **Inspect (TI).**

23. **Install access cover L540** (para 2-2-2).

END OF TASK

11-6-18. SERVOCYLINDER ROD END ADJUSTMENT 11-6-18

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Rigging Kit, Control System	1730-01-240-1577

Materials/Parts:

(E24) Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

Equipment Conditions:

Ref	Condition
1-7-2	Helicopter safed

NOTE

- This task is typical for all servocylinder rod ends.
- To adjust collective rod, install collective rig pins (para 11-6-3).

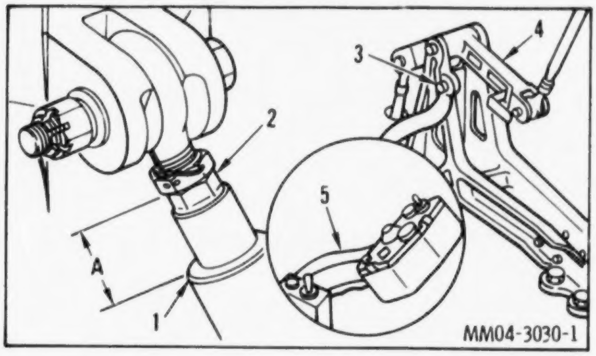
1. **Adjust rod end on collective servocylinder:**

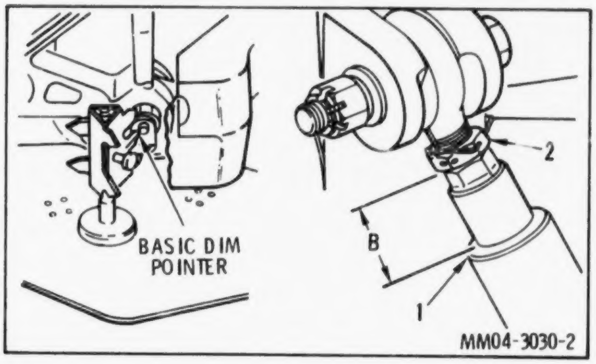
   a. Measure distance between top of collective servocylinder housing (1) and bottom of locknut (2). This is measurement A.

   b. Remove collective rig pins (3) from collective bellcrank (4). (para 11-6-3).

   c. Move pilot collective stick (5) to aline BASIC DIM pointer (para 11-6-5).

   d. Measure distance between housing (1) and locknut (2). This is measurement B.





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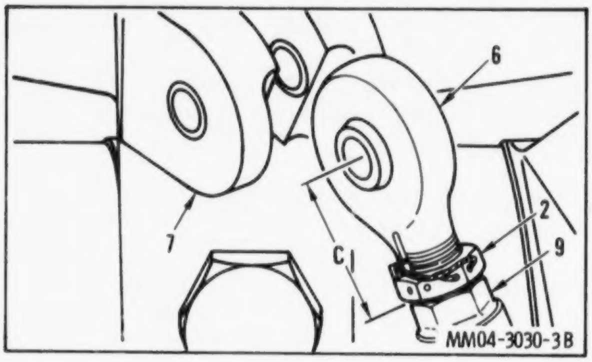
e. Disconnect servocylinder rod end (6) from collective mixer bellcrank (7) (para 7-2-41).

f. Remove lockwire (8). Loosen locknut (2).

g. Measure distance between top of piston (9) and center of rod end (6). This is measurement C.



WARNING

To provide enough thread engagement to maintain safe flight, the distance between center of rod end and end of servocylinder piston must not exceed 3.06 inches.

CAUTION

To prevent breakdown of cylinder piston rings, rotation of piston is limited to **90 DEGREES** during rigging and installation. Adjustments are made by turning rod end, **not** piston.

h. Adjust rod end (6) by turning it in or out of piston (9).

  (1) If measurement A is larger than measurement B, turn rod end (6) into piston (9). Shorten measurement C an amount equal to difference between measurements A and B.

  (2) If measurement A is smaller than measurement B, turn rod end (6) out of piston (9). Lengthen measurement C an amount equal to difference between measurements A and B.

i. Reconnect servocylinder rod end (6).

j. Tighten locknut (2).

k. Lockwire nut (2) to lock (para 7-2-41). Use lockwire (E24).

l. Inspect (TI).

m. Complete collective upper flight controls rigging (para 11-6-5).

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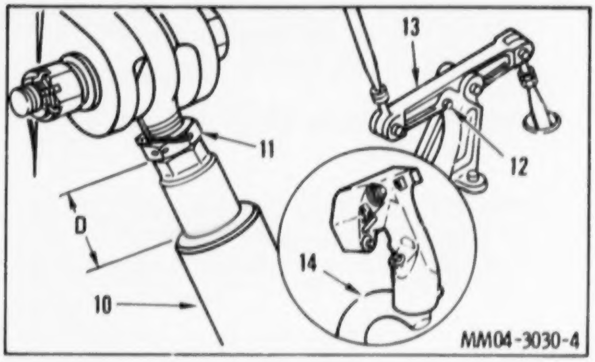
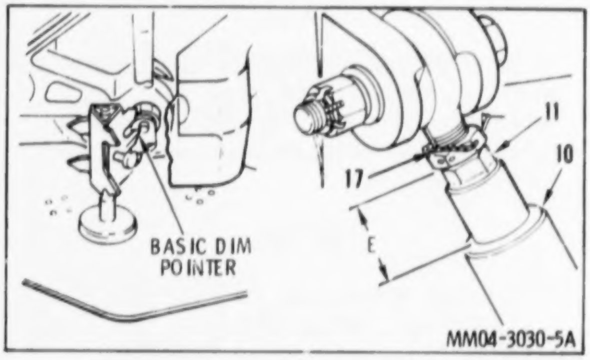
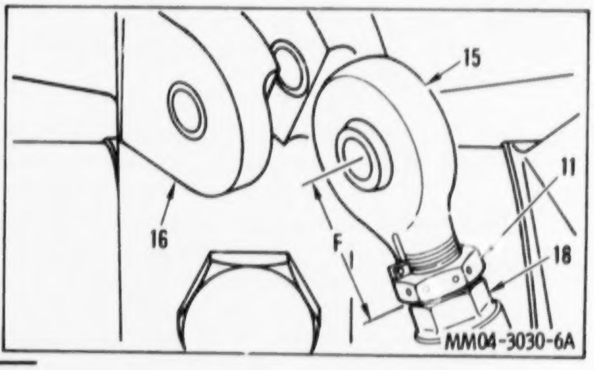






NOTE

To adjust longitudinal rods, install longitudinal rig pins (para 11-6-7).

2. **To adjust rod end on longitudinal servocylinder.**

   a. Measure distance between top of longitudinal servocylinder housing (10) and bottom of locknut (11). This is measurement D.

   b. Remove longitudinal rig pins (para 11-6-7).

   c. Move pilot cyclic stick (14) to aline BASIC DIM pointer (para 11-6-9).

   d. Measure distance between housing (10) and locknut (11). This is measurement E.

   e. Disconnect servocylinder rod end (15) from longitudinal mixer bellcrank (16) (para 7-2-47).

   f. Remove kockwire (17). Loosen lock nut (11).

   g. Measure distance between top of piston (18) and center of rod end (15). This is measurement F.

WARNING

To provide enough thread engagement to maintain safe flight, the distance between center of rod end and end of servocylinder piston must not exceed 3.06 inches.

CAUTION

To prevent breakdown of cylinder piston rings, rotation of piston is limited to **90 DEGREES** during rigging and installation. Adjustments are made by turning rod end **not** piston.

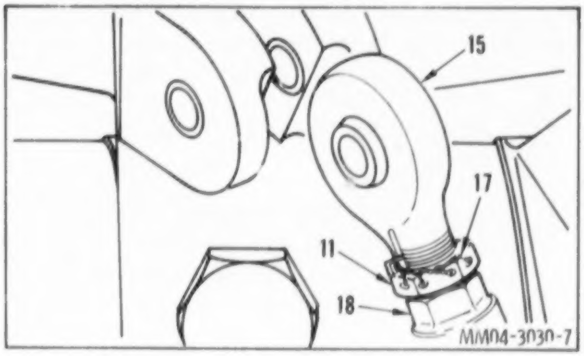
GO TO NEXT PAGE

11-6-18. SERVOCYLINDER ROD END ADJUSTMENT (cont) 11-6-18

h. Adjust rod end (15) by turning in or out of piston (18).

(1) If measurement D is larger than measurement E, turn rod end (15) into piston (18). Shorten measurement F an amount equal to difference between measurements D and E.

(2) If measurement D is smaller than measurement E, turn rod end (15) out of piston (18). Lengthen measurement F an amount equal to difference between measurements D and E.



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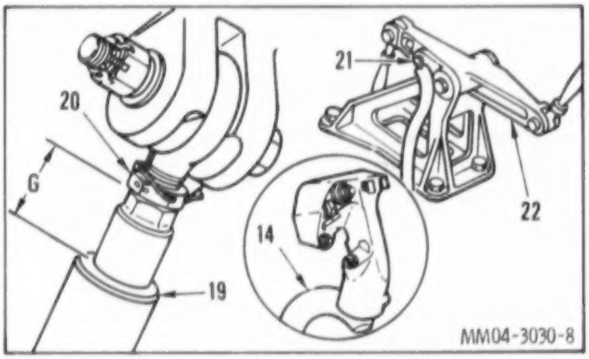

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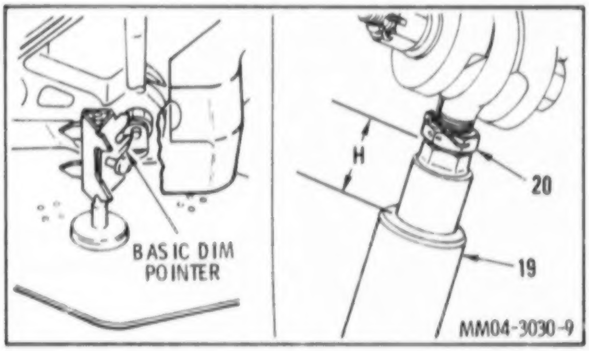


MM04-3030-9

i. Reconnect servocylinder rod end (15).

j. Tighten locknut (11).

k. Lockwire nut (11) to nut (17) (para 7-2-47). Use lockwire (E24).

l. Inspect (TI).

m. Continue rigging longitudinal upper flight control (para 11-6-9).

NOTE

To adjust lateral rod, install lateral rig pins (para 11-6-11).

3. **To adjust rod end on lateral servocylinder:**

a. Measure distance between top of collective lateral servocylinder housing (19) and bottom of locknut (20). This is measurement G.

b. Remove lateral rig pins (para 11-6-11).

c. Move pilot cyclic stick (14) to aline BASIC DIM pointer (para 11-6-13).

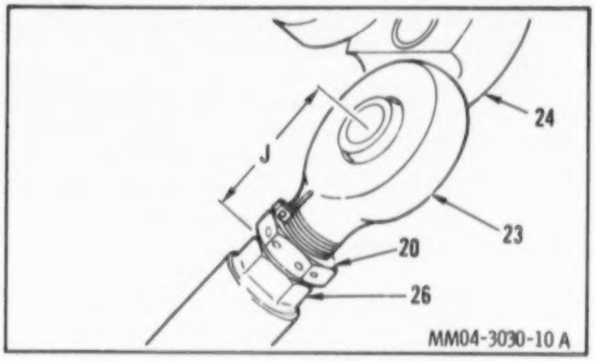
d. Measure distance between housing (19) and locknut (20). This is measurement H.

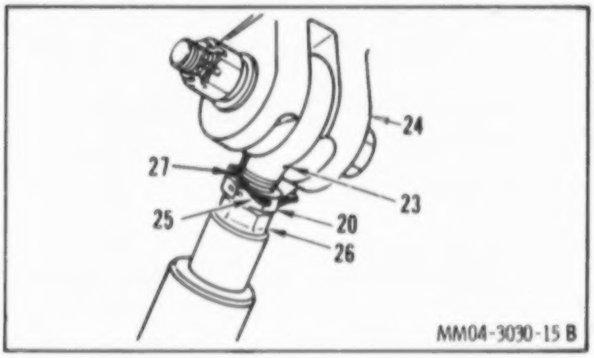
GO TO NEXT PAGE

e. Disconnect servocylinder rod end (23) from lateral mixer bellcrank (24) (para 7-2-44).

f. Remove lockwire (25). Loosen lock nut (20).

g. Measure distance between top of piston (26) and center of rod end (23). This is measurement J.





WARNING

To provide enough thread engagement to maintain safe flight, the distance between center of rod end and end of servocylinder piston must not exceed 3.06 inches.

CAUTION

To prevent breakdown of cylinder piston rings, rotation of piston (26) is limited to 90 DEGREES during rigging and installation. Adjustments are made by turning rod end (23) not piston (26).

h. Adjust rod end (23) by turning in or out of piston (26).

   (1) If measurement G is larger than measurement H, turn rod end (23) into piston (26). Shorten measurement J an amount equal to difference between measurements G and H.

   (2) If measurement G is smaller than measurement H, turn rod end (23) out of piston (26). Lengthen measurement J an amount equal to difference between measurements G and H.

i. Reconnect servocylinder rod end (23).

j. Tighten locknut (20).

k. Lockwire nut (20) to lock (27). Use lockwire (E24).

l. Inspect (TI).

m. Continue rigging lateral upper flight controls (para 11-6-13).

GO TO NEXT PAGE

11-6-18. SERVOCYLINDER ROD END ADJUSTMENT (cont) 11-6-18

NOTE

To adjust directional rod, install directional rig pins (para 11-6-15).

4. **To adjust rod end on directional servocylinder.**

   a. Measure distance between top of directional servocylinder housing (28) and bottom of locknut (29). This is measurement K.

   b. Remove directional rig pin (para 11-6-15).

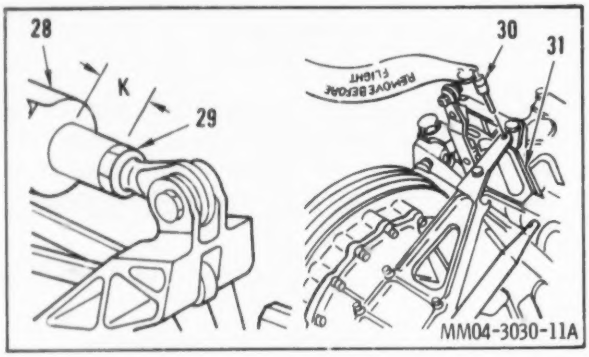
   c. Move pilot directional pedals (32) to aline BASIC DIM hole (para 11-6-17).

   d. Measure distance between housing (28) and locknut (29). This is measurement L.

   e. Disconnect servocylinder rod end (33) from directional bellcrank (34) (para 7-2-38).

   f. Remove lockwire (35). Loosen lock nut (29).

   g. Measure distance between top of piston (36) and center of rod end (33). This is measurement M.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REMOVE BEFORE FLIGHT
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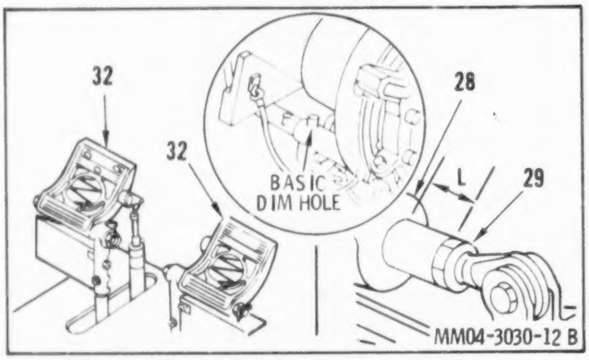
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BASIC DIM HOLE
28
L
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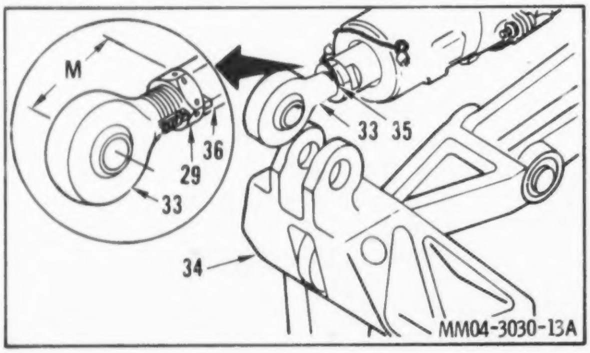
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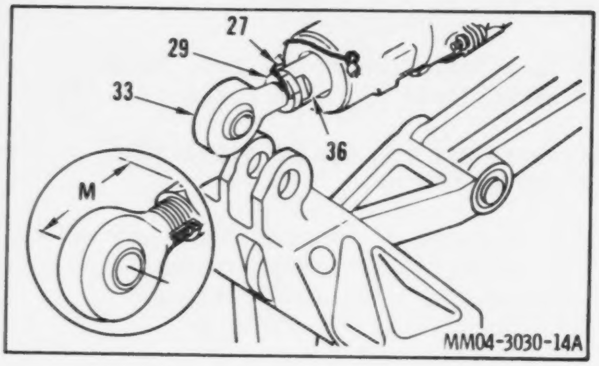


WARNING

To provide enough thread engagement to maintain safe flight, the distance between center of rod end and end of servocylinder piston must not exceed 3.06 inches.

CAUTION

To prevent breakdown of cylinder piston rings, rotation of piston (36) is limited to **45 DEGREES** during rigging and installation. Adjustments are made by turning rod end (33) not piston (36).

h. Adjust rod end (33) by turning in or out of piston (36).

  (1) If measurement K is larger than measurement L, turn rod end (33) into piston (36). Shorten measurement M an amount equal to difference between measurements K and L.

  (2) If measurement K is smaller than measurement L, turn rod end (33) out of piston (36). Lengthen measurement M an amount equal to difference between measurements K and L.

i. Reconnect servocylinder rod end (33).

j. Tighten locknut (29).

k. Lockwire nut (29) to housing (28) (para 7-2-38). Use lockwire (E24).

l. Inspect (TI).

m. Continue rigging directional upper flight controls (para 11-6-17).

END OF TASK

11-6-19. RIGGING HORIZONTAL STABILATOR 11-6-19

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Aviation Ground Power Unit (AGPU)	1730-01-144-1897
Fixture, Stabilator Rigging	1730-01-220-8033
Rigging Kit, Control Systems	1730-01-240-1577
Protractor Assembly	5120-00-212-8727
Headset-Microphone (2)	5965-00-755-4656
Cord Assembly, Electrical-Maintenance Headset	5995-01-163-9549
Crowfoot Attachment 1-1/8, 3/8 Drive	5120-00-517-7021
Wrench, Torque 3/8 Drive	5120-00-288-8865

Materials/Parts:

	Cotter Pin (2)
(E8)	Lockwire

Personnel Required:

67R10	Attack Helicopter Repairer (2) One to assist
66R30	Inspector/Supervisor

References:

TM 55-1520-238-T

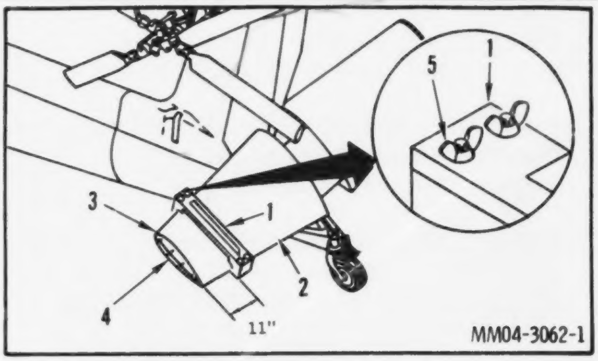
Equipment Conditions:

Ref	Condition
2-2-2	Access panel R200 and covers L545 and R545 removed.

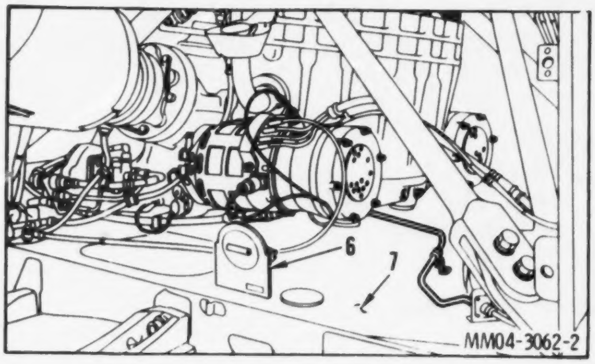
1. **Install stabilator rigging fixture (1) on horizontal stabilator (2).**

   a. Position fixture (1) on stabilator (2) 11 inches inboard of seam (3) formed by the left tip cap (4) and stabilator (2).

   b. Tighten four wing nuts (5) on fixture (1).



2. **Zero protractor (6).** Place protractor (6) on transmission deck (7).



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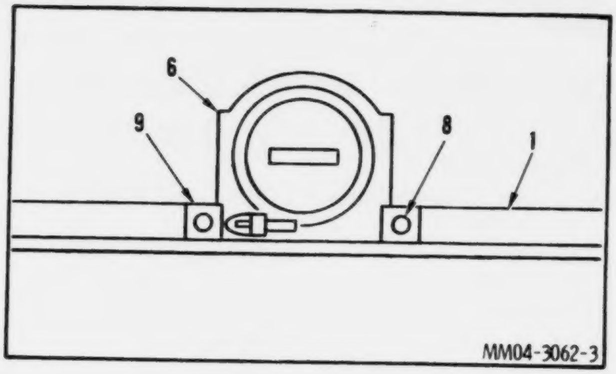
11-6-19. RIGGING HORIZONTAL STABILATOR (cont)

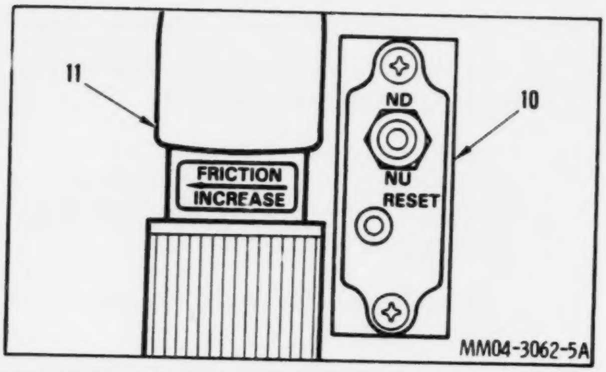
3. Attach protractor (6) to fixture (1).
   a. Loosen two thumbscrews (8) that attach clamping blocks (9) to fixture (1).
   b. Place protractor (6) between blocks (9) and fixture (1). Be sure that bottom of protractor (6) is flat against fixture (1).
   c. Tighten two thumbscrews (8).



WARNING

Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.

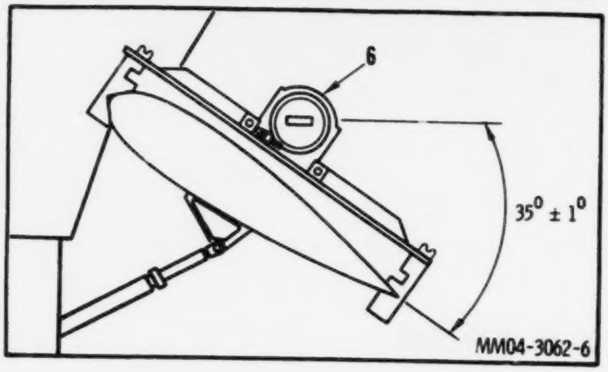
4. Connect ground power unit (GPU) (para 1-7-16).
5. Enter pilot station (para 1-7-1). Observe all safety precautions.
6. Close STAB MAN DC and STAB MAN AC circuit breakers on pilot aft circuit breaker panel.
7. Using stabilator manual control (10) on pilot collective stick (11), actuate stabilator to full trailing edge down (TED) position.



8. Determine stabilator angle from protractor (6). This angle must be 34 to 36 degrees.

NOTE

If angle is in limits, go with step 10. If angle is out of limits, perform step 9.



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11-6-19. RIGGING HORIZONTAL STABILATOR (cont) 11-6-19

9. **Adjust stabilator actuator (15) to obtain 34 to 36 degrees TED.**

   a. Disconnect AGPU (para 1-7-16).

   b. Remove actuator (15) from helicopter (para 11-4-25).

   NOTE

   - Adjust both actuator rod ends equally.
   - Dimension A must not exceed **0.970-inch.**
   - Adjust rod ends in **1/2 TURN** increments.

   c. Remove lockwire from two locknuts (16).

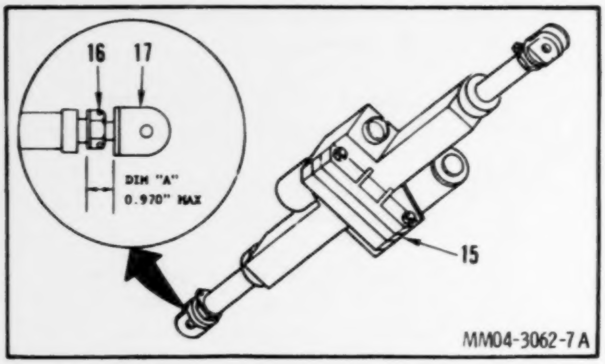
   d. Loosen two locknuts (16).

   e. Adjust rod ends (17) as follows:

      (1) If stabilator angle was too small, turn both rod ends (17) clockwise **1/2 TURN.**

      (2) If stabilator angle was too large, turn both rod ends (17) counterclockwise **1/2 TURN.**

   f. Temporarily install actuator (15) in helicopter, using attaching bolts only.



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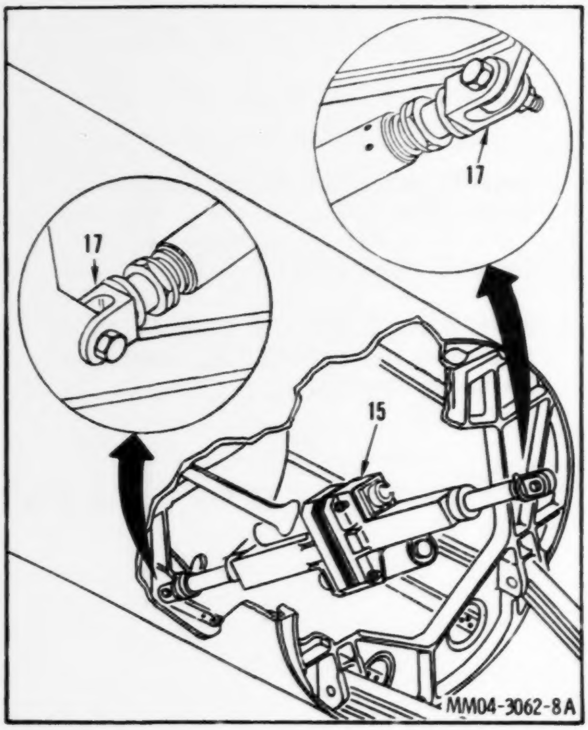

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11-6-19. RIGGING HORIZONTAL STABILATOR (cont) 11-6-19

g. Check stabilator angle is **34 to 36 degrees.**

(1) If angle is still not in limits, repeat step e. above.

(2) If angle is in limits, continue with step h.

(3) If unable to make adjustment without exceeding Dimension A limits, replace actuator (15) (para 11-4-25).

h. Remove actuator (15) from helicopter.

10. **Without moving two rod ends (17), torque two nuts (16) to 300 INCH-POUNDS.**

a. Hold two rod ends (17).

b. Torque two nuts (16) to **300 INCH-POUNDS.** Use crowfoot and 3/8 drive torque wrench.

c. Lockwire two nuts (16). Use lockwire (E8).

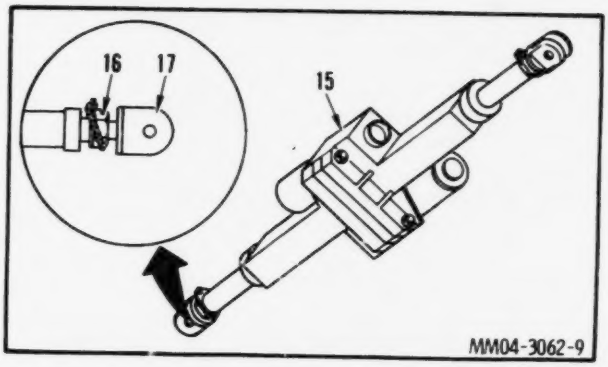
11. **Install actuator in helicopter** (para 11-4-25).

12. **Connect AGPU** (para 1-7-16).

13. **Verify pilot and CPG stabilator position indicators (18) indicate 34 to 36 degrees.**

NOTE

If indicators are in limits, go with step 15.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17
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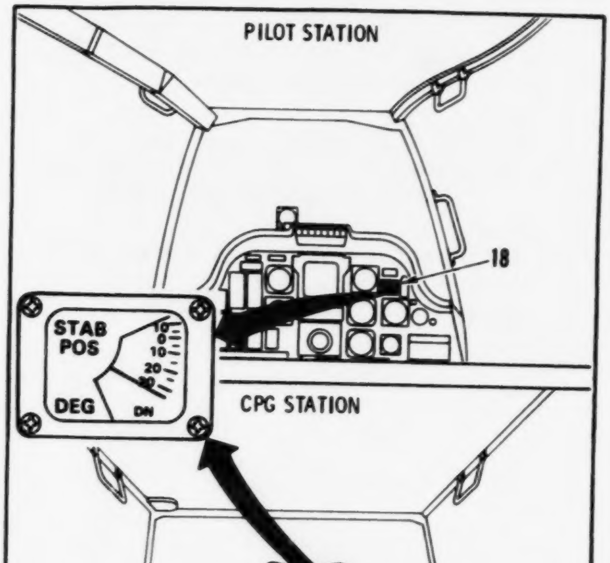
PILOT STATION
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STAB POS
10
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10
20
30
DEG
DN
CPG STATION
18
MM04-3062-10

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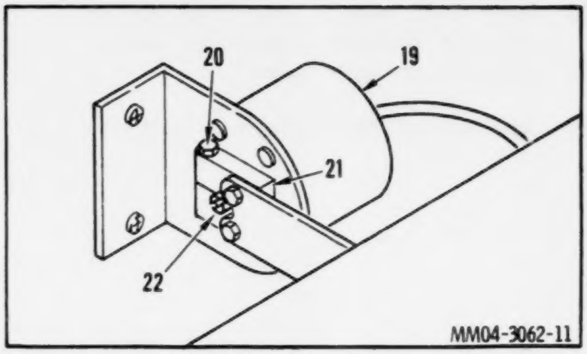
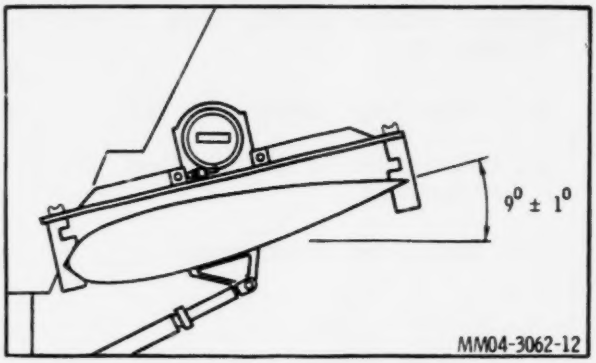
11-6-19. RIGGING HORIZONTAL STABILATOR (cont) 11-6-19

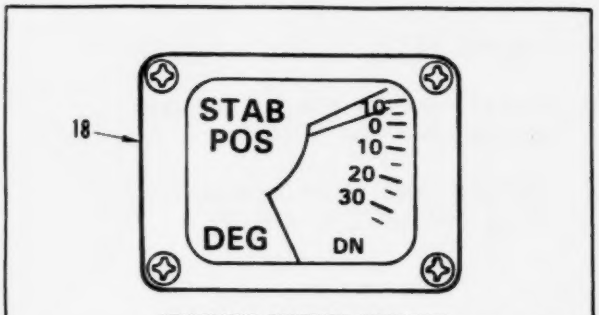
14. **Adjust position transducer (19) to obtain 34 to 36 degrees on pilot and CPG indicators (18).**
    a. Loosen bolt (20) on sensor clamp (21).
    b. Adjust transducer (19) by turning shaft (22) until cockpit indicators (18) indicate **34 to 36 degrees.**
    c. Tighten bolt (20) on sensor clamp (21).
    d. If unable to adjust within limits, replace transducer (19) (para 11-4-28).
    e. If CPG indicator is not in 2 degrees of pilot indicator, refer to TM 55-1520-238-T.



15. **Actuate stabilator to full trailing edge up (TEU) position.**



16. **Check stabilator TEU angle is 8 to 10 degrees.** If angle is not within limit, replace actuator (para 11-4-25).



STABILATOR POSITION INDICATOR MM04-3062-13

17. **Check that both pilot and CPG indicators (18) indicate 9 ±2 degrees.** If indicators are not within limits, replace position transducer (19) (para 11-4-28).

GO TO NEXT PAGE

18. **Open STAB MAN DC and STAB MAN AC circuit breakers on pilot aft circuit breaker panel.**

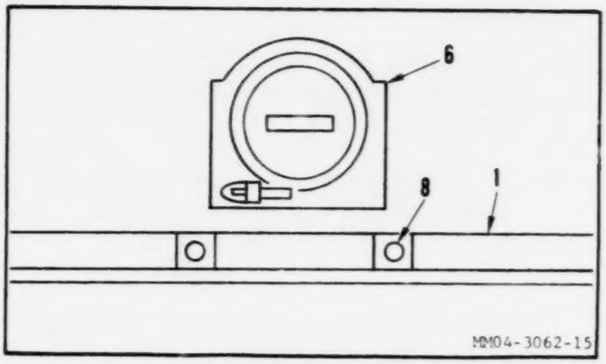
19. **Disconnect AGPU** (para 1-7-16).

20. **Remove protractor (6) from fixture (1).**

    a. Loosen two thumbscrews (8).

    b. Remove protractor (6) from fixture (1).

    c. Tighten two thumbscrews (8).

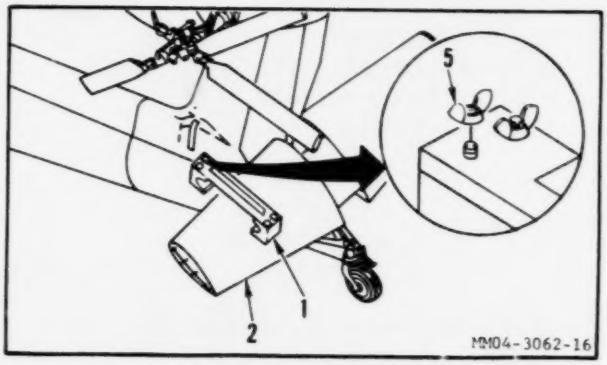


21. **Remove fixture (1) from stabilator (2).** Loosen four wing nuts (5). Remove fixture (1).

22. **Inspect** (TI).

23. **Install access panel R200 and covers L545 and R545** (para 2-2-2).

24. **Perform stabilator operational check** (TM 55-1520-238-T).



END OF TASK

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.
125	line		20	I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C